MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT § 102 OCEAN DUMPING PERMIT

PERMIT NUMBER AND TYPE: OD98-01 Special

EFFECTIVE DATE:

March 1, 1998

EXPIRATION DATE:

February 28, 2001

PERMITTEE:

StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

WASTE GENERATOR:

StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

WASTE GENERATED AT:

StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

PORT OF DEPARTURE:

Pago Pago Harbor, American Samoa

WASTE TRANSPORTER: FV TASMAN SEA

Blue North Fisheries, Inc. 1130 N.W. 45th Street

Seattle, Washington 98107-4626

A special ocean dumping permit is being issued to StarKist Samoa, Inc. The Regional Administrator of EPA Region IX has determined that disposal of fish processing wastes off American Samoa meets EPA's ocean dumping criteria at 40 C.F.R. Parts 227 and 228. For this permit, the term "fish processing wastes" shall refer to Dissolved Air Flotation (DAF) Sludge, Cooker Juice and Press Liquor generated at the permittee's plant in Pago Pago, American Samoa; or any combination of the three waste streams pumped from StarKist Samoa's onshore holding tanks into the ocean disposal vessel for transportation to the ocean disposal site.

This special permit authorizes the transportation and dumping into ocean waters of fish processing wastes as described in the special conditions section pursuant to the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 (33 U.S.C. § 1401 et seq.) as amended (hereinafter referred to as "the Act"); regulations issued thereunder; and the terms and conditions stated below.

This MPRSA Special Permit does not contain any information collection requirements subject to Office of Management and Budget review under the Paper Work Reduction Act of 1980 (44 U.S.C. § 3501 *et seq.*). This determination has been made because the permit does not require data collection by more than 10 persons.

1. GENERAL CONDITIONS

- 1.1. Operation under this special ocean dumping permit shall conform to all applicable federal statutes and regulations including, but not limited to, the Act, the Marine Plastic Pollution Research and Control Act of 1987 (P.L. 100-220), the Clean Water Act (33 U.S.C. § 1251 et seq.), and the Ports and Waterways Safety Act (33 U.S.C. § 1221 et seq.).
- 1.2. All transportation and dumping authorized herein shall be undertaken in a manner consistent with the terms and conditions of this permit. StarKist Samoa, Inc. (hereafter referred to as "the permittee") shall be liable for compliance with all such terms and conditions. The permittee shall be held liable under § 105 of the Act (33 U.S.C. § 1415) if any permit violations occur. During disposal operations when the permittee's fish processing wastes are loaded aboard the disposal vessel in holding tanks, either separately or combined with similar fish processing wastes from other permittees authorized to use the ocean disposal site defined in Special Condition 2.2, the permittees shall be held individually liable under § 105 of the Act (33 U.S.C. § 1415) if a permit violation occurs. If a permit violation occurs during the transportation and disposal of fish processing wastes, the waste transporter may also be liable for permit violations.
- 1.3. Under § 105 of the Act, any person who violates any provision of the Act, 40 C.F.R. Parts 220 through 228 promulgated thereunder, or any term or condition of this permit shall be liable for a civil penalty of not more than \$50,000 per day for each violation. Additionally, any knowing violation of the Act, 40 C.F.R. Parts 220 through 228, or the permit may result in a criminal action being brought with penalties of not more than \$50,000 or one year in prison, or both. Violations of the Act or the terms and conditions of this permit include but are not limited to:
 - 1.3.1. Transportation to, and dumping at any location other than that defined in Special Condition 2.2 of this permit;
 - 1.3.2. Transportation and dumping of any material not identified in this permit, more frequently than authorized in this permit, or more than the quantities identified in this permit, unless specifically authorized by a written modification hereto;
 - 1.3.3. Failure to conduct permit monitoring as required in Special Conditions 3.1, 3.3.1, 4.7 and 5.1; or
 - 1.3.4. Failure to file reports on fish processing wastes and disposal site monitoring reports as required in the Special Conditions.

- 1.4. Nothing contained herein shall be deemed to authorize, in any way, the transportation from the United States for the purpose of dumping into the ocean waters, the territorial sea, or the contiguous zone, the following materials:
 - 1.4.1. High-level radioactive wastes;
 - 1.4.2. Materials, in whatever form, produced for radiological, chemical, or biological warfare;
 - 1.4.3. Persistent synthetic or natural materials which may float or remain in suspension in the ocean; or
 - 1.4.4. Medical wastes as defined in § 3(k) of the Act.
 - 1.4.5. Flotables, garbage, domestic trash, waste chemicals, solid waste, or any materials prohibited by the Act or the Marine Plastic Pollution Research and Control Act.
- 1.5. Nothing contained herein shall be deemed to authorize, in any way, violation of applicable American Samoa Water Quality Standards. The following water quality standards apply:

Table 1. 1989 American Samoa Water Quality Standards: Oceanic Waters [§24.0207(g)(1-7)].

Parameter	Median Not to Exceed the Given Value
Turbidity	0.20 NTU
Total Phosphorus	11.0 μg-P/L
Total Nitrogen	115.0 μg-N/L
Chlorophyll a	0.18 μg/L
Light Penetration Depth	150 feet, to exceed the given value 50% of the time.
Dissolved Oxygen	Not less than 80% of saturation or less than 5.5 mg/L. If the natural level of dissolved oxygen is less than 5.5 mg/L, then the natural dissolved oxygen level shall become the standard.
pН	The pH range shall be 6.5 to 8.6 pH units and within 0.2 pH units of the level which occurs naturally.

Should the American Samoa Water Quality Standards applicable to this permit be revised, such revised standards shall apply to this permit.

- 1.6. After notice and opportunity for a hearing, this permit may be revised, revoked or limited, in whole or in part, subject only to the provisions of 40 C.F.R. §§ 222.3(b) through 222.3(h) and 40 C.F.R. § 223.2, as a result of a determination by the Regional Administrator of EPA that:
 - 1.6.1. The cumulative impact of the permittee's dumping activities or the aggregate impact of all dumping activities in the dump site designated in Special Condition 2.2 should be categorized as Impact Category I, as defined in 40 C.F.R. § 228.10(c)(1);
 - 1.6.2. There has been a change in circumstances regarding the management of the disposal site designated in Special Condition 2.2;
 - 1.6.3. The dumping authorized by the permit would violate applicable American Samoa Water Quality Standards;
 - 1.6.4. The dumping authorized can no longer be carried out consistent with the criteria defined at 40 C.F.R. Parts 227 and 228;
 - 1.6.5. The permittee violated any term or condition of the permit;
 - 1.6.6. The permittee misrepresented, or did not accurately disclose all relevant facts in the permit application or monitoring reports; or
 - 1.6.7. The permittee did not keep records, engage in monitoring and reporting activities, or to notify appropriate officials in a timely manner of the transportation and dumping activities as specified in any condition of this permit.
- 1.7. The permittee shall ensure always that facilities, including any vessels associated with the permit, are in good working order to achieve compliance with the terms and conditions of this permit. During all loading operations, there shall not be a loss of fish processing wastes to any waterway. During transport to the disposal site, there shall not be a loss of fish processing wastes to Pago Pago Harbor or the ocean.
- 1.8. The permittee shall notify the Regional Administrator or his delegate in writing of any change in the designated fish processing waste transporter at least 30 days before the transfer date. Written approval by the EPA Regional Administrator must be obtained before such a transfer occurs.

- 1.9. The permittee shall allow the EPA Regional Administrator, the Commander of the Fourteenth U.S. Coast Guard District (USCG), the Director of the American Samoa Environmental Protection Agency (ASEPA), and/or their authorized representatives to:
 - 1.9.1. Enter into, upon, or through the permittee's premises, vessels, or other premises or vessels under the control of the permittee, where, or in which, a source of material to be dumped is located or in which any records are required to be kept under the terms and conditions of this permit or the Act;
 - 1.9.2. Have access to and copy any records required to be kept under the terms and conditions of this permit or the Act;
 - 1.9.3. Inspect any dumping equipment, navigational system equipment, monitoring equipment or monitoring methods required in this permit;
 - 1.9.4. Sample or require that a sample be drawn, under EPA, USCG, or ASEPA supervision, of any materials discharged or to be discharged; or
 - 1.9.5. Inspect laboratory facilities, data, and quality control records required for compliance with any condition of this permit.
- 1.10. If material which is regulated by this permit is disposed of, due to an emergency, such as to safeguard life at sea, in locations or in a manner that does not comply with the terms of this permit, the permittee shall make a full report, according to the provisions of 18 U.S.C. § 1001, within 15 days to the EPA Regional Administrator, the USCG and the ASEPA describing the conditions of this emergency and the actions taken, including the location, the nature and the amount of material disposed.
- 1.11. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of rights, nor any infringement of Federal, State or local laws or regulations, nor does it obviate the necessity of obtaining State or local assent required by applicable law for the activity authorized.
- 1.12. This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities, or, except as authorized by this permit, the conduct of any work in any navigable waters.
- 1.13. Unless otherwise provided for herein, all terms used in this permit shall have the meanings assigned to them by the Act or 40 C.F.R. Parts 220 through 228, issued thereunder.

2. SPECIAL CONDITIONS - DISPOSAL SITE AND FISH PROCESSING WASTE CHARACTERIZATION

Special conditions are necessary to define the length of the permit period, identify the disposal site location, describe fish processing waste streams and define maximum permitted limits for the combined three waste streams (DAF sludge, cooker juice and press liquor) stored in on-shore storage tanks.

2.1. Location of the Waste Generator and Duration of the Permit

- 2.1.1. The material to be dumped shall consist of fish processing wastes, defined in Special Conditions 2.3 and 2.4, generated at the permittee's fish cannery in Pago Pago, American Samoa.
- 2.1.2. This permit shall become effective on March 1, 1998 and it shall expire three years from the effective data at midnight on February 28, 2001.

2.2. Location of Disposal Site

Disposal of fish processing wastes generated at the location defined in Special Condition 2.1.1 shall be confined to a circular area with a 1.5 nautical mile radius, centered at 14² 24.00' South latitude by 170³ 38.30' West longitude.

2.3. Description of Fish Processing Wastes

2.3.1. During the term of this permit, and according to all other terms and conditions of this permit, the permittee is authorized to transport and dispose a combined waste stream total maximum of 200,000 gallons per day of fish processing wastes. The fish processing wastes-- Dissolve Air Flotation (DAF) sludge, cooker juice and press liquor/water-- are combined and stored in the permittee's onshore storage tanks prior to transport to the ocean disposal site.

2.4. Fish Processing Waste Stream Limits

Fish processing waste stream limits apply to the combined fish wastes of DAF sludge, cooker juice and press liquor/water, which are combined and stored in an onshore storage tank prior to transport to the ocean disposal site (see Table 3 - following page).

Table 3. Limits for Onshore Storage Tank Fish Wastes

Physical or Chemical Parameter (units) ^a	Storage Tank
Total Solids (mg/L)	101,800
Total Volatile Solids (mg/L)	84,100
5-Day BOD (mg/L)	129,390
Oil and Grease (mg/L)	62,940
Total Phosphorus (mg/L)	1,750
Total Nitrogen (mg/L)	10,980
Ammonia (mg/L)	11,810
pH (pH units)	6.2 to 7.1
Density (g/mL)	0.97 to 1.03

- a = All calculated values were rounded to the nearest 10, except density and pH ranges.
- 2.4.2. Permitted Maximum Concentrations for the onshore storage tank fish waste were calculated based on an analysis of data over a 4-year period from the permittee's previous Special Ocean Dumping Permit, number OD 93-01. The calculations followed EPA's recommended procedure for determining permit limits as defined in the EPA document titled: "Guidance Document for Ocean Dumping Permit Writers" (January 30, 1988). EPA Region IX will periodically review these limits during the permit to evaluate the accuracy of the limits. If revisions are necessary, EPA Region IX will make changes according to the authority defined in the Ocean Dumping Regulations at 40 C.F.R. §§ 223.2 through 223.5.
- 2.4.3. The Permitted Maximum Concentrations, density range and pH range listed above, shall not be exceeded at any time during the term of this permit.

3. SPECIAL CONDITIONS - ANALYSIS OF FISH PROCESSING WASTES

Compliance with the permitted maximum concentrations defined in Special Condition 2.4 shall be determined by monthly monitoring of the waste in the onshore storage tank. The sampling dates shall be scheduled within the first two weeks of the month to allow enough time for laboratory analyses and report writing to comply with Special Condition 3.3.

3.1. Analyses of Fish Processing Wastes

- 3.1.1. Concentrations or values of the parameters listed in Special Condition 2.4 and those listed in the table below shall be determined for the waste in the onshore storage tank. Once a month, the permittee shall analyze samples taken from its onshore fish processing waste storage tank during the transfer of these wastes to the disposal vessel's holding tanks.
 - 3.1.1.1. Three samples shall be taken from the onshore storage tank transfer line at 10 minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee.
 - 3.1.1.2. The parameters and detection limits listed in Table 4 shall be analyzed and used for the onshore storage tank composite samples.

Table 4. Physical and Chemical Parameters and Associated Method Detection Limits for Analyses of Onshore Storage Tank Waste

Parameter	Method Detection Limit
Total Solids	10.0 mg/L
Total Volatile Solids	10.0 mg/L
5-Day BOD	10.0 mg/L
Oil and Grease	10.0 mg/L
Total Phosphorus	1.0 mg/L
Total Nitrogen	1.0 mg/L
Ammonia	1.0 mg/L
рН	0.1 pH units
Density	0.01 g/mL

- 3.1.2. All sampling procedures, analytical protocols, and quality control/quality assurance procedures shall be performed according to guidelines specified by EPA Region IX. The following references shall be used by the permittee:
 - 3.1.2.1. 40 C.F.R. Part 136, EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act;
 - 3.1.2.2. Tetra Tech, Incorporated. 1985. Summary of U.S. EPA-approved Methods, Standard Methods and Other Guidance for 301(h)

 Monitoring Variables. Final program document prepared for the Marine Operations Division, Office of Marine and Estuarine Protection, U.S. Environmental Protection Agency. EPA Contract No. 68-01-693. Tetra Tech, Incorporated, Bellevue, WA.; and
 - 3.1.2.3. Environmental Protection Agency. 1987. Quality Assurance and Quality Control for 301(h) Monitoring Programs: Guidance on Field and Laboratory Methods. Office of Marine and Estuarine Protection, Washington, D.C. EPA 430/9-86-004.

3.2. Analytical Laboratory

- 3.2.1. Within 30 days of the effective date of this permit, the name and address of the contract laboratory or laboratories and a description of all analytical test procedures and quality assurance/quality control procedures, including detection limits being used, shall be provided to EPA Region IX.
- 3.2.2. Any potential variation or change in the designated laboratory or analytical procedures shall be reported, in writing, for EPA Region IX approval.
- 3.2.3. EPA Region IX may require analyses of quality control samples by any laboratories employed to comply with Special Condition 3.1 and Appendix A. Upon request, the permittee shall provide EPA Region IX with the analytical results from such samples.
- 3.2.4. Should there be a modification in the permittee's fish processing procedures such that there may be a significant change in the quality of a fish processing waste stream (DAF sludge, cooker juice or press liquor) EPA Region IX and ASEPA shall be notified 60 days prior to such modification. At their discretion, either agency may require that the permittee conduct a complete analysis of parameters for specified waste streams, and report the results to EPA Region IX and ASEPA within 30 days of sampling. (A sample shall consist of three replicate grab samples pooled for use as a composite sample. The detection limits specified in Table 4 shall be used in all fish processing waste stream analyses.) If necessary, bioassays may be required in addition to parameter analyses.

3.3. Reporting

- 3.3.1. The permittee shall provide EPA Region IX, ASEPA, the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS) and the Western Pacific Regional Fishery Management Council (WPRFMC) with a report, prepared every 3 months during the permit period, that contains the following information:
 - 3.3.1.1. Daily volume of fish processing waste (total combined waste streams of DAF Sludge, Cooker Juice and Press Liquor) generated at the permittee's facility and pumped into the permittee's onshore storage tanks to be reported in gallons per day using Form 1 (see Appendix B);
 - 3.3.1.2. Daily volume of fish processing waste disposed at the ocean disposal site to be reported in gallons per day using Form 1 (see Appendix B);
 - 3.3.1.3. Monthly fish processing waste analyses from the onshore storage tank demonstrating that the fish processing wastes being dumped comply with the permitted limits of parameters listed in Special Condition 2.4 and a cumulative yearly summary of the volumes of fish processing wastes disposed at the ocean site using Form 2 (see Appendix B);
 - 3.3.1.4. The monthly amount of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams reported in pounds per month (see Forms 1 and 2).
- 3.3.2. Such reports, including a comparison with the permit limits as required on Forms 1 and 2, shall be submitted to EPA Region IX, ASEPA, NMFS USFWS and WPRFMC within 45 days of the end of the preceding 3-month period for which they were prepared. The reports shall be submitted within this time unless extenuating circumstances are communicated to EPA Region IX and the ASEPA in writing. In addition to a hard copy of Forms 1 and 2, the data contained on Form 1 shall be submitted to EPA Region IX on a 3.5" computer diskette in a LOTUS spreadsheet format (i.e., wk1), including name of cannery, permit number, and months for which the data is submitted.
- 3.3.3. A summary report of all 3-month reports listed in Special Condition 3.3.1, including a comparisons with permit limits and a detailed discussion of the summary results, shall be submitted by the permittee to EPA and the ASEPA 60 days after the permit expires. Delay or non-compliance with this requirement will (respectively) delay or preclude renewal of the permit. All fish processing waste data shall be reported in the same format as required in Special Condition 3.3.2.

- 3.3.4. Upon detection of a violation of any permit condition, the permittee shall send a written notification of this violation to EPA Region IX and the ASEPA within five working days and a detailed written report of the violation shall be sent to the agencies within 15 working days. This notification shall pertain to any permit limits (defined in Special Condition 2.4) that are exceeded, violation of volume limits (defined in Table 2 under Special Condition 2.3.1), and any disposal operation that occurs outside the disposal site defined in Special Condition 2.2.
- 3.3.5. Twenty-four months from the effective date of this special permit, the permittee shall submit a report to EPA and ASEPA on the results of confirmatory suspended phase acute toxicity bioassay tests and dilution model calculations (i.e., Limiting Permissible Concentration) of the predicted concentrations of fish processing wastes disposed at the designated site. The suspended phase bioassays shall be conducted using at least one species from each of the following three groups: Group 1 = Mytilus sp. (mussel), Crassostrea sp. (oyster), Acartia tonsa (copepod), or Trypneustes sp. (sea urchin) larvae; Group 2 = Holmesimysis costata (mysid shrimp) or Penaeus vannamei (white shrimp); and Group 3 = Citharicthys stigmaeus (speckled sanddab) or Coryphaena hippurus (dolphinfish) juveniles.

Appropriate suspended phase bioassay protocols, either protocols approved by EPA or protocols published by the American Society for Testing and Materials (ASTM), shall be followed. Suspended particulate phase bioassays shall be run using the following fish processing waste concentrations: 100%, 75%, 50%, 25%, 10%, 5%, and a control (0%). A minimum of five replicates are required per dilution concentration. Concurrent reference toxicant tests shall be conducted when the suspended phase bioassays are run.

A sampling and testing plan shall be submitted to EPA Region IX and ASEPA for approval before the bioassay tests are conducted. Samples for the suspended particulate phase bioassays shall be composited from the permittee's onshore storage tanks. Three samples shall be taken from the onshore storage tank transfer line at 10 minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee. Samples shall be collected and shipped to the testing laboratory according to EPA-approved methods to ensure that the samples do not change before the bioassay tests begin. All suspended particulate phase bioassays shall be started within 10 days of sampling.

If changes in processing and /or disposal operations should occur, an additional re-evaluation of the disposal model may also be required. These evaluations (bioassays and/or modeling) would be used to confirm the toxicity of the fish processing wastes and to evaluate the disposal operations based on the use of a different disposal vessel or different mode of disposal.

The confirmatory bioassay report shall contain the following information:

3.3.5.1. INTRODUCTION AND PROJECT DESCRIPTION

The project description should include the following information about fish processing waste toxicity, previous bioassay test results, and the design of the new bioassay tests. If modeling analysis is necessary, then previous modeling at the ocean disposal site should also be included.

3.3.5.2. MATERIALS AND METHODS

Fish processing waste sampling and sample handling procedures should be described or referenced.

References for laboratory protocols for suspended phase bioassay tests.

- 1) EPA-approved methods and references.
- 2) Test species used in each test, the supplier or collection site for each test species, and QA/QC procedures for maintaining the test species.
- 3) Source of seawater used in reference, control and bioassay tests.
- 4) Data and statistical analysis procedures.
- 5) Limiting Permissible Concentration (LPC) calculations.
- 6) If modeling analysis is required as stipulated in Special Condition 3.3.5., description of model selected to evaluate dispersal of fish processing wastes at the ocean disposal site. Use of this model shall be approved by EPA Region IX and ASEPA before it is used by the permittee to evaluate the fish processing waste disposal plume.

3.3.5.3. DESCRIPTION OF SAMPLING PROCEDURES

QA/QC procedures and actual sampling procedures used during fish processing waste stream sampling and handling of the samples.

3.3.5.4. FINAL RESULTS, ANALYSIS OF DATA AND DISCUSSION

- 1) Complete bioassay data tables and summary bioassay tables shall be furnished in the report. All data tables should be typed or produced as a computer printout.
- 2) The permittee shall analyze the bioassay data and calculate the LPC of the material as defined at 40 C.F.R. § 227.27(a-b).
- The permittee shall use the LPC in the approved plume model to determine the concentration of fish processing wastes disposed at the designated ocean disposal site which complies with EPA's Ocean Dumping Criteria defined at 40 C.F.R. Parts 227 and 228.

3.3.5.5. REFERENCES

This list should include all references used in the field sampling program, laboratory protocols, LPC calculations, modeling analyses, and historical data used to evaluate the fish processing waste disposal operations at the designated ocean disposal site.

3.3.5.6. DETAILED QA/QC PLANS AND INFORMATION

The following topics should be addressed in the QA Plan:

- 1) QA objectives.
- 2) Organization, responsibilities and personnel qualifications, internal quality control checks.
- 3) Sampling and analytical procedures.
- 4) Equipment calibration and maintenance.
- 5) Sample custody and tracking.
- 6) documentation, data reduction, and reporting.
- 7) Data validation.
- 8) Performance and systems audits.
- 9) Corrective action.
- 10) Reports.

4. SPECIAL CONDITIONS - VESSEL OPERATIONS

Specifications for vessel operations are defined to limit dumping activities to the dump site identified in Special Condition 2.2 and to record all dumping activities. The permittee's fish processing wastes and fish processing wastes of other authorized permittees may be loaded into the disposal vessel together or separately.

4.1. Posting of the Permit

This permit, or a true copy thereof, shall be placed in a conspicuous place on any vessel which is used for the transportation and dumping authorized by this permit.

4.2. Vessel Identification

Every vessel engaged in the transportation of fish processing wastes for ocean disposal shall have its name and number painted in letters and numbers at least fourteen (14) inches high on both sides of the vessel. The name and number shall be kept distinctly legible always, and a vessel without such markings shall not be used to transport or dump fish processing wastes.

4.3. Determination of the Disposal Location Within the Dump Site

On each disposal trip, the master of the disposal vessel shall determine the location of the disposal operation as follows:

- 4.3.1. The disposal vessel, as defined under WASTE TRANSPORTER on page 1 of this permit, shall proceed directly to the center of the disposal site at the location specified in Special Condition 2.2.
- 4.3.2. The master of the vessel shall observe the conditions at the dump site center, noting the vessel's position (latitude and longitude), wind direction and observed surface current direction.
- 4.3.3. After the conditions defined in Special Condition 4.3.2 have been recorded, the master of the disposal vessel shall proceed 1.1 nautical miles up current from the center of the disposal site and record the position of the disposal vessel (latitude and longitude). This position shall be the starting point for disposal operations for each disposal trip.
- 4.3.4. The master of the disposal vessel shall prepare a hard copy (i.e., on 8.5 inch by 11 inch paper) of the computerized navigational plot documenting compliance with the procedures defined in Special Conditions 4.3.1 through 4.3.4. The hard copy of the computerized navigational plot for each disposal trip shall be supplied to the permittee. The permittee shall submit these hard copies of the computerized navigational plots with the 3-month reports required under Special Condition 3.3.1. The hard copies of the navigational plots shall include:

- 4.3.4.1. The disposal vessel's course during the entire dumping operation; and
- 4.3.4.2. The times and location of entry and exit from the disposal site, position and time of arrival at the center of the disposal site, position and time of arrival at the location 1.1 nautical miles up current from the disposal site, beginning and ending position and time of dumping operations, and disposal vessel position plotted every 15 minutes while dumping operations occur.
- 4.3.5. The master of the disposal vessel shall sign and date each hard copy of the computerized navigational plots certifying that the hard copies are an accurate record of the disposal vessel's track for each disposal trip.
- 4.3.6. The master of the disposal vessel shall certify that disposal operations occurred in the manner required by the permit.
- 4.3.7. The procedures listed in Special Conditions 4.3.1 through 4.3.6 shall be repeated for each disposal trip.

4.4. Disposal Rate and Vessel Speed

- 4.4.1. The disposal vessel/barge shall discharge the material authorized by this permit beginning at the disposal location as determined by Special Condition 4.3.3. The vessel track shall be in a direction that is perpendicular to the current detected at the center of the disposal site as defined in Special Condition 2.2. Disposal shall occur in a target area defined by an oval shape track along an axis at least 0.5 nautical miles on either side of the starting point determined in Special Condition 4.3.3. The entire disposal vessel track shall be within the disposal site boundaries.
- 4.4.2. Deviations from normal disposal operations (as described in Section 4.4.1) must be reported within 30 days of the date of occurrence. If such deviation should occur, the master of the disposal vessel shall describe the adverse conditions in the log and submit a record of the disposal trip, including the computer-generated navigational plot. Minor deviations in the vessel's track due to adverse ocean conditions (e.g. large waves, strong winds, etc.) are allowed as long as disposal operations occur in the prescribed target area thereby allowing the fish waste to disperse within the disposal site boundaries. If adverse sea state conditions prevent ocean disposal operations in this manner, then all operations shall cease until sea state conditions are compatible with the required disposal operations.
- 4.4.1.3. From June 1 through November 30, fish processing wastes shall be pumped from the disposal vessel into the ocean at a rate of 140 gallons per minute per knot, not to exceed 1,400 gallons per minute at a maximum speed of 10 knots.

4.4.1.4. From December 1 through May 31, fish processing wastes shall be pumped from the disposal vessel into the ocean at a rate of 120 gallons per minute per knot, not to exceed 1,200 gallons per minute at a maximum speed of 10 knots.

4.5. Computerized Navigational System

The permittee shall use an onboard computerized electronic positioning system to fix the position of the disposal vessel accurately during all dumping operations. The computerized navigational system and the method to produce a 8.5 inch by 11 inch hard copy of each disposal operation must be approved by EPA Region IX and the USCG Liaison Office (CGLO) Pago Pago. The permittee shall submit the description, specifications and example hard copy plots for the computerized navigational system before the date of the first disposal operations under this permit. Disposal operations shall not begin until EPA Region IX and CGLO Pago Pago provide the permittee with written approval for the computerized navigation system and the hard copy plots.

4.6. Permitted Times for Disposal Operations

Dumping operations shall be restricted to daylight hours, unless an emergency exists as defined at 40 C.F.R. § 220.1(c)(4). ASEPA and CGLO Pago Pago shall be notified immediately if an emergency exists and ocean disposal is required to protect human life at sea. No later than 5 working days after the emergency, the permittee and the waste transporter shall provide EPA Region IX, ASEPA and CGLO Pago Pago with a detailed written report on the emergency situation.

4.7. Reporting of the Ocean Dumping Vessel Operations

- 4.7.1. The waste transporter shall maintain and the permittee shall submit copies of a daily transportation and dumping log, including hard copy plots of all information required in Special Conditions 4.3 and 4.7.2. Copies of the daily logs shall be sent to EPA Region IX, CGLO Pago Pago, and the ASEPA as part of the 3-month report.
- 4.7.2. The logbook shall contain the following information for each disposal trip:
 - 4.7.2.1. Permit number, date and unique consecutive trip number;
 - 4.7.2.2. Record of contact with ASEPA and CGLO before each trip to the ocean disposal site;
 - 4.7.2.3. The time when loading of the vessel commences and ceases in Pago Pago Harbor;
 - 4.7.2.4. The volume of fish processing waste loaded into the disposal vessel from each fish cannery;

- 4.7.2.5. The time and navigational position that dumping commences and ceases;
- 4.7.2.6. A record of vessel speed and direction every 15 minutes during each dumping operation at the disposal site, and a hard copy of the vessel's course defined in Special Condition 4.3;
- 4.7.2.7. Discharge rate from the disposal vessel.
- 4.7.2.8. Observe, note and plot the time and position of any floatable material;
- 4.7.2.9. Observe, note and plot the wind speed and direction every 30 minutes while dumping fish processing wastes at the designated disposal site;
- 4.7.2.10. Observe and note current direction at the beginning and end of the disposal trip, and the direction of the disposal plume at the end of the disposal operation;
- 4.7.2.11. Observe, note and plot the presence of any visible (previous) disposal plume and any unusual occurrences during the disposal trip, or any other information relevant to the assessment of environmental impacts as a result of dumping activities; and
- 4.7.2.12. Any unusual occurrences noted under Special Condition 4.7.2.9 shall be highlighted in the report defined in Special Condition 3.3.1.
- 4.7.2.13. Any deviation from the normal disposal pattern such as circumstances described in Special Condition 4.4.2 and reasons for the deviation.

5. SPECIAL CONDITIONS - DUMP SITE MONITORING

The monitoring program for disposal of fish processing wastes in the ocean must document effects of disposed wastes on the receiving waters, biota, and beneficial uses of the receiving waters; compliance with EPA's Ocean Dumping Regulations; and compliance with permit terms and conditions. Revisions to the monitoring program may be made under the direction of EPA Region IX at any time during the permit term, in compliance with 40 C.F.R. §§ 223.2 and 223.3. This may include a change in the number of parameters to be monitored, the frequency of monitoring, the location of sample stations, or the number and size of samples to be collected.

Implementation of the disposal site monitoring program and all segments of the monitoring program specified in Special Condition 5 and Appendix A shall be the responsibility of the permittee.

5.1. Monitoring Program

The permittee shall conduct the monitoring program, defined in Appendix A, to determine the environmental impacts of ocean dumping of fish processing waste. If possible, monitoring cruises shall be scheduled within the first two weeks of each month to allow enough time for laboratory analysis and report writing in compliance with Special Condition 5.2. The permittee shall notify the ASEPA at least 48 hours before any scheduled monitoring activities.

5.2. Monitoring Reports

Monthly site monitoring reports shall be submitted to EPA Region IX, the ASEPA, NMFS, USFWS and WPRFMC with the 3-month reports as specified in Special Condition 3.3.2. The reports shall include: neatly compiled raw data for all sample analyses, and quality assurance/quality control data. An annual report shall include: an annual compilation of data, statistical analysis of sample variability between stations and within samples for each parameter, and a detailed discussion of the results.

5.3. Final Summary Report

- 5.3.1. A report shall be submitted to EPA Region IX, ASEPA, NMFS, USFWS and WPRFMC 60 days after the permit expires. This report shall summarize all of the data collected to characterize fish processing wastes and the results of the dump site monitoring program specified in this special permit.
- 5.3.2. At a minimum, the summary report shall contain the following sections:
 - 5.3.2.1. Introduction (including a summary of previous ocean disposal activities),
 - 5.3.2.2. Location of Sampling Sites,

- 5.3.2.3. Materials and Methods,
- 5.3.2.4. Results and Discussion (including comparisons and contrasts with previous MPRSA § 102 research and special permit data related to disposal of fish processing wastes off American Samoa),
- 5.3.2.5. Conclusions; and
- 5.3.2.6. References.

5.4. Quality Assurance/Quality Control

- 5.4.1. All appropriate phases of the monitoring, sampling, and laboratory analytical procedures shall comply with the EPA Region IX-specified protocols and references listed in Special Condition 3.1.2.
- 5.4.2. The qualifications of the on-site Principal Investigator in charge of the field monitoring operation at the dump site shall be submitted to EPA Region IX and the ASEPA for approval whenever a new Principal Investigator is retained. Notification of any change in this individual shall be submitted to EPA Region IX and ASEPA at least 7 days before the cruise is scheduled.

6. SPECIAL CONDITIONS - NOTICE TO REGULATORY AGENCIES

- 6.1. Notice of Sailing to the U.S. Coast Guard Liaison Office and the American Samoa Environmental Protection Agency
 - 6.1.1. The waste transporter shall provide telephone notification of sailing to CGLO Pago Pago at 633-2299 and the ASEPA at 633-2304 during working hours (7:00 a.m. to 3:30 p.m.) no later than 24 hours before the estimated time of departure for the dump site defined in Special Condition 2.2. A record of contact with both agencies shall be reported with other information for each disposal trip.
 - 6.1.2. The waste transporter shall immediately notify CGLO Pago Pago and the ASEPA upon any changes in the estimated time of departure greater than two hours.
 - 6.1.3. Surveillance of activities at the dump site designated in Special Condition 2.2, may be accomplished by unannounced aerial overflights or observation from another vessel by EPA Region IX, ASEPA, USCG or American Samoa Department of Public Safety personnel; or a USCG ship rider and/or a ASEPA or EPA Region IX ship rider who will be on board the towing/conveyance vessel for the entire voyage. Within two hours after receipt of the initial notification the waste transporter will be advised whether or not a ship rider will be assigned to the waste transporter's disposal vessel.

- 6.1.4. The following information shall be provided to CGLO Pago Pago and the ASEPA in the notification of sailing defined above:
 - 6.1.4.1. The time of departure,
 - 6.1.4.2. Estimated time of arrival at the dump site,
 - 6.1.4.3. Estimated time of departure from the dump site, and
 - 6.1.4.4. Estimated time of return to port.

6.2. Reports and Correspondence

6.2.1. Two copies of all reports and related correspondence required by General Condition 1.10, Special Conditions 3.2, 3.3, 4.3, 4.5, 4.6, 4.7, 5.2, 5.3, 6.1, and all other materials, including applications shall be submitted to EPA Region IX at the following address:

Office of Pacific Insular Area Programs (CMD-5) U.S. Environmental Protection Agency, Region IX 75 Hawthorne Street San Francisco, California 94105-3901 Telephone (415) 744-2170

6.2.2. One copy of all reports required by General Condition 1.10 and Special Conditions 4.5, 4.6, 4.7 and 6.1 sent to the U.S. Coast Guard shall be submitted to the following address:

Commanding Officer
U.S. Coast Guard Liaison Office
P.O. Box 249
Pago Pago, American Samoa 96799
Telephone (684) 633-2299

6.2.3. One copy of all reports required by General Condition 1.10 and Special Conditions 3.2, 3.3, 4.3, 4.5, 4.6, 4.7, 5.2, 5.3, and 6.1 sent to the American Samoa Environmental Protection Agency shall be submitted to the following address:

Director American Samoa Environmental Protection Agency Office of the Governor Pago Pago, American Samoa 96799 Telephone (684) 633-2304

6.2.4. One copy of the all reports required by Special Conditions 3.3, 5.2 and 5.3 shall be sent to the USFWS, the NMFS and the WPRFMC at the following addresses:

Project Leader Office of Environmental Services U.S. Fish and Wildlife Service 300 Ala Moana Boulevard P.O. Box 50167 Honolulu, Hawaii 96850

Western Pacific Program Officer National Marine Fisheries Service 2570 Dole Street Honolulu, Hawaii 96822-2396

Executive Director Western Pacific Regional Fishery Management Council 1164 Bishop Street, Suite 1405 Honolulu, Hawaii 96813

For the Regional Administrator:

Alexis Strauss, Acting Director

Water Division

U.S. EPA, Region IX

APPENDIX A

SPECIAL OCEAN DUMPING PERMIT OD 98-01 OCEAN DUMP SITE MONITORING PLAN

7. MONITORING OF RECEIVING WATER

Monitoring of the receiving waters at the disposal site defined in Special Condition 2.2 shall be the responsibility of the permittee. The required site monitoring may be accomplished jointly through an agreement between permittee and other permittees authorized to use the disposal site. Any such agreements negotiated between the permittee and other authorized permittees shall be the sole responsibility of the permittee named in this permit. EPA Region IX requires that a monitoring program be developed that complies with the special conditions defined below.

During each monitoring cruise, the disposal plume from the disposal vessel shall be sampled by taking discrete water samples for the measurement of parameters listed in Special Condition 7.2.4.

7.1. Location of Water Sampling Stations

- 7.1.1. On each sampling cruise, the latitude and longitude of all sampling stations shall be determined and plotted using an acceptable navigational system.
- 7.1.2. The Principal Investigator shall ensure that discrete water samples are taken at the locations marked in Figure 1.

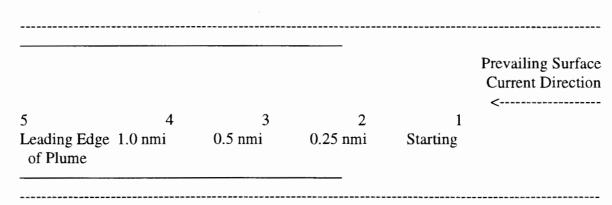


Figure 1. Orientation of Sample Stations (Top View) in the Middle of the Discharge Plume Visually Identified at the Time of Sampling.

- 7.1.3. The following stations, defined in Figure 1, shall be sampled on each sampling cruise:
 - 7.1.4.1. Station 1 shall be the starting point of the dumping operation as determined in Special Condition 4.3.
 - 7.1.4.2. Station 2 shall be 0.25 nautical miles (nmi) down-current from Station 1.
 - 7.1.4.3. Station 3 shall be 0.5 nmi down-current from Station 1.
 - 7.1.4.4. Station 4 shall be 1.0 nmi down-current from Station 1.
 - 7.1.4.5. Station 5 shall be at the leading edge of the discharge plume, but within the plume.
- 7.1.4. The Principal Investigator shall ensure that each sampling station is positioned as close as possible to the middle of the discharge plume according to his/her best professional judgment.

7.2. Water Column Characteristics to Be Measured

- 7.2.1. Discrete water samples at Stations 1, 2, 3, 4, and 5 shall be taken at depths of 1, 3, and 10 meters from the surface at the middle of the plume visually identified by the Principal Investigator.
- 7.2.2. Surface water conditions shall be recorded at all stations including:
 - 7.2.2.1. Wind speed and direction;
 - 7.2.2.2. Current direction and wave height; and
 - 7.2.2.3. Observations of plume color (e.g., Forel-Ule color scale), odor, floating materials, grease, oil, scum, and foam.
- 7.2.3. Water samples shall be obtained using a self-closing 3-liter water sample device at each depth listed in 7.2.1.

!

7.2.4. Water column parameters analyzed from discrete samples taken at the depths listed in 7.2.1 shall include:

Table 4. Physical and Chemical Parameters to be Analyzed from Water Samples Taken at the Ocean Disposal Site.

Parameter ^a	Method Detection Limit
Total Suspended Solids	10.0 mg/L
Total Volatile Suspended Solids	10.0 mg/L
Oil and Grease	10.0 mg/L
Total Phosphorus	1.0 mg/L
Total Nitrogen	1.0 mg/L
Ammonia	1.0 mg/L
рН	0.1 pH units

a = Samples should be acidified to pH <2 with sulfuric acid and refrigerated at $4^{\circ}C$ until analysis.

7.2.5. Temperature measurements shall be taken at depths of 1, 3, and 10 meters at the starting point of the disposal operation, as defined in Special Condition 4.3.3.

7.3. Frequency of Sampling

- 7.3.1. Water samples shall be collected in association with active dumping operations. Each station listed under Special Condition 7.1 shall be sampled once each month. These samples shall be used to characterize the receiving waters at the disposal site.
- 7.3.2. Control samples shall be taken at Station 1 before dumping activities.
- 7.3.3. Station 1 shall be sampled at a point within the plume immediately after discharge operations cease.
- 7.3.4. Stations 2 through 5 shall be sampled consecutively at distances indicated in Special Condition 7.1.4 to allow efficient sampling of the discharge plume. The time between each sample and the sampling location, beginning with the control

sample and ending with the sample collected at the leading edge of the plume, shall be recorded.

7.4. Water Quality Criteria and Standards

7.4.1. The Limiting Permissible Concentration (LPC) of the liquid phase of the fish processing wastes shall not be exceeded beyond the disposal site boundary within four hours after dumping or at any point in the marine environment after four hours. The LPC, as defined at 40 C.F.R. §227.27, shall not exceed applicable American Samoa Oceanic Water Quality Standards (see Table 1). EPA Region IX and the ASEPA will evaluate the LPC based on EPA's Ocean Dumping Regulations and the concentration of parameters measured at the stations sampled during the tenure of this permit.

8. MONITORING OF BIOLOGICAL COMMUNITIES

8.1. Pelagic Resources

- 8.1.1. All sightings of fish, sea turtles, sea birds, or cetaceans near the disposal site shall be recorded including:
 - 8.1.1.1. Time, location and bearing;
 - 8.1.1.2. Species name(s); and
 - 8.1.1.3. Approximate number of individuals.

'PENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Waste Disposed at the Ocean Site Volume Limit = 200,000 Gallons

Month	19
1.1011	

<< Conversion Note: For a Lotus spreadsheet (i.e., wk1), use 3-column format. >>

Date	Total Volume Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	Date	Total Volume Generated (gallons/day)	Volume Ocean Disposed (gallons/day)
1			17		
2			18		
3			19		
4			20		
5			21		
6			22		
7			23		
8			24		
9			25		
10			26		
11			27		
12			28		
13			29		
14			30		
15			31		
16					
SUBTOTAL			SUBTOTAL		
			GRAND TOTAL		-

			GRAND TOTAL			
	• • •	t of the date of fish of violations this me	•	volume signifies t	hat a violation of the perr	ni
Monthly quantit	ies of alum (alumi	num sulfate) and co	oagulant polymer a	added to the fish p	rocessing waste streams:	
	Aluminum sulfate: Coagulant polymer		oounds/month oounds/month			

APPENDIX B - REPORT FORM 2

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA § 102 Permit #OD 98-01

Reporting	Period:	From	19	Τ	o	1	19	

StarKist Samoa - On-Shore Storage Tank Waste

<< Conversion Note: For a Lotus spreadsheet, use wkl format with layout below. >>

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Deman (mg/L)	ađ	Oil and Grease (mg/L)	Total Phosphor (mg/L)	us	Total Nitros	gen	Ammonia (mg/L)	pH (pH unit	:ន)	Density (g/mL)	
														_
OD 98-01 Permit Limits	101,800	84,100	129,390		62,940	1,750		10,980		11,810	6.2 to 5	7.1	0.97 to 1.	.03

^{*}Note an asterisk (*) next to the waste concentration signifies that a violation of the permit limit has occurred.

Cumulative Yearly Data on Fish Processing Wastes Generated at StarKist Samoa's Plant and Disposed at the Ocean Site. MPRSA §102 Special Permit #OD 98-01

Reporting	Period	d
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From	19
To	19

<< Conversion Note: For a Lotus, use wk1 format with layout below. >>

Month & Year	Total Generated (gallons/month)	Aluminum sulfate (pounds/month)	Coagulant polymer (pounds/month)	Volume Ocean Disposed (gallons/month)	Volume Ocean Disposed (gallons/month)
		-			
		*			
Cumulative Yearly Totals					

NOTE: A separate table shall be prepared for each calendar year.

MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT § 102 OCEAN DUMPING PERMIT

PERMIT NUMBER AND TYPE: OD 93-01 Special

EFFECTIVE DATE:

September 1, 1993

EXPIRATION DATE:

August 31, 1996

PERMITTEE:

StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

WASTE GENERATOR:

StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

WASTE GENERATED AT:

StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

PORT OF DEPARTURE:

Pago Pago Harbor, American Samoa

WASTE TRANSPORTER:

FV TASMAN SEA

Blue North Fisheries, Inc. 1130 N.W. 45th Street

Seattle, Washington 98107-4626

A special ocean dumping permit is being issued to StarKist Samoa, Inc. because the Regional Administrator of EPA Region IX has determined that disposal of fish processing wastes off American Samoa meets EPA's ocean dumping criteria at 40 C.F.R. Parts 227 and 228. For this permit, the term "fish processing wastes" shall refer to Dissolved Air Flotation (DAF) Sludge, Cooker Juice and Press Liquor generated at the permittee's plant in Pago Pago, American Samoa; or any combination of the three waste streams pumped from StarKist Samoa's onshore holding tanks into the ocean disposal vessel for transportation to the ocean disposal site.

This special permit authorizes the transportation and dumping into ocean waters of fish processing wastes as described in the special conditions section pursuant to the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 (33 U.S.C. § 1401 et seq.) as amended (hereinafter referred to as "the Act"); regulations issued thereunder; and the terms and conditions stated below.

This MPRSA Special Permit does not contain any information collection requirements subject to Office of Management and Budget review under the Paper Work Reduction Act of 1980 (44 U.S.C. § 3501 et seq.). This determination has been made because the permit does not require data collection by more than 10 persons.

1. GENERAL CONDITIONS

- 1.1. Operation under this special ocean dumping permit shall conform to all applicable federal statutes and regulations including, but not limited to, the Act, the Marine Plastic Pollution Research and Control Act of 1987 (P.L. 100-220), the Clean Water Act (33 U.S.C. § 1251 et seq.), and the Ports and Waterways Safety Act (33 U.S.C. § 1221 et seq.).
- 1.2. All transportation and dumping authorized herein shall be undertaken in a manner consistent with the terms and conditions of this permit. StarKist Samoa, Inc. (hereafter referred to as "the permittee") shall be liable for compliance with all such terms and conditions. The permittee shall be held liable under § 105 of the Act (33 U.S.C. § 1415) if any permit violations occur. During disposal operations when the permittee's fish processing wastes are loaded aboard the disposal vessel in holding tanks, either separately or combined with similar fish processing wastes from other permittees authorized to use the ocean disposal site defined in Special Condition 2.2, the permittees shall be held individually liable under § 105 of the Act (33 U.S.C. § 1415) if a permit violation occurs. If a permit violation occurs during the transportation and disposal of fish processing wastes, the waste transporter may also be liable for permit violations.
- 1.3. Under § 105 of the Act, any person who violates any provision of the Act, 40 C.F.R. Parts 220 through 228 promulgated thereunder, or any term or condition of this permit shall be liable for a civil penalty of not more than \$50,000 per day for each violation. Additionally, any knowing violation of the Act, 40 C.F.R. Parts 220 through 228, or the permit may result in a criminal action being brought with penalties of not more than \$50,000 or one year in prison, or both. Violations of the Act or the terms and conditions of this permit include but are not limited to:
 - 1.3.1. Transportation to, and dumping at any location other than that defined in Special Condition 2.2 of this permit;
 - 1.3.2. Transportation and dumping of any material not identified in this permit, more frequently than authorized in this permit, or more than the quantities identified in this permit, unless specifically authorized by a written modification hereto;
 - 1.3.3. Failure to conduct permit monitoring as required in Special Conditions 3.1, 3.3.1, 4.7 and 5.1; or
 - 1.3.4. Failure to file reports on fish processing wastes and disposal site monitoring reports as required in the Special Conditions.

- 1.4. Nothing contained herein shall be deemed to authorize, in any way, the transportation from the United States for the purpose of dumping into the ocean waters, the territorial sea, or the contiguous zone, the following materials:
 - 1.4.1. High-level radioactive wastes;
 - 1.4.2. Materials, in whatever form, produced for radiological, chemical, or biological warfare:
 - 1.4.3. Persistent synthetic or natural materials which may float or remain in suspension in the ocean; or
 - 1.4.4. Medical wastes as defined in § 3(k) of the Act.
 - 1.4.5. Flotables, garbage, domestic trash, waste chemicals, solid waste, or any materials prohibited by the Act or the Marine Plastic Pollution Research and Control Act.
- 1.5. Nothing contained herein shall be deemed to authorize, in any way, violation of applicable American Samoa Water Quality Standards. The following water quality standards apply:

Table 1. 1989 American Samoa Water Quality Standards: Oceanic Waters [§24.0207(g)(1-7)].

Parameter	Median Not to Exceed the Given Value	
Turbidity	0.20 NTU	
Total Phosphorus	11.0 μg-P/L	
Total Nitrogen	115.0 μg-N/L	
Chlorophyll a	0.18 μg/L	
Light Penetration Depth	150 feet, to exceed the given value 50% of the time.	
Dissolved Oxygen	Not less than 80% of saturation or less than 5.5 mg/L. If the natural level of dissolved oxygen is less than 5.5 mg/L, then the natural dissolved oxygen level shall become the standard.	
рН	The pH range shall be 6.5 to 8.6 pH units and within 0.2 pH units of the level which occurs naturally.	

- 1.6. After notice and opportunity for a hearing, this permit may be revised, revoked or limited, in whole or in part, subject only to the provisions of 40 C.F.R. §§ 222.3(b) through 222.3(h) and 40 C.F.R. § 223.2, as a result of a determination by the Regional Administrator of EPA that:
 - 1.6.1. The cumulative impact of the permittee's dumping activities or the aggregate impact of all dumping activities in the dump site designated in Special Condition 2.2 should be categorized as Impact Category I, as defined in 40 C.F.R. § 228.10(c)(1);
 - 1.6.2. There has been a change in circumstances regarding the management of the disposal site designated in Special Condition 2.2;
 - 1.6.3. The dumping authorized by the permit would violate applicable American Samoa Water Quality Standards;
 - 1.6.4. The dumping authorized can no longer be carried out consistent with the criteria defined at 40 C.F.R. Parts 227 and 228;
 - 1.6.5. The permittee violated any term or condition of the permit;
 - 1.6.6. The permittee misrepresented, or did not disclose all relevant facts in the permit application accurately; or
 - 1.6.7. The permittee did not keep records, engage in monitoring and reporting activities, or to notify appropriate officials in a timely manner of the transportation and dumping activities as specified in any condition of this permit.
- 1.7. The permittee shall ensure always that facilities, including any vessels associated with the permit, are in good working order to achieve compliance with the terms and conditions of this permit. During all loading operations, there shall not be a loss of fish processing wastes to any waterway. During transport to the disposal site, there shall not be a loss of fish processing wastes to Pago Pago Harbor or the ocean.
- 1.8. Any change in the designated fish processing waste transporter may be made at the discretion of the Regional Administrator or his delegate. A written request for such a transfer shall be made by the permittee at least thirty (30) days before the requested transfer date. Written approval by the EPA Regional Administrator must be obtained before such a transfer occurs.
- 1.9. The permittee shall allow the EPA Regional Administrator, the Commander of the Fourteenth U.S. Coast Guard District (USCG), the Director of the American Samoa Environmental Protection Agency (ASEPA), and/or their authorized representatives to:

- 1.9.1. Enter into, upon, or through the permittee's premises, vessels, or other premises or vessels under the control of the permittee, where, or in which, a source of material to be dumped is located or in which any records are required to be kept under the terms and conditions of this permit or the Act;
- 1.9.2. Have access to and copy any records required to be kept under the terms and conditions of this permit or the Act;
- 1.9.3. Inspect any dumping equipment, navigational system equipment, monitoring equipment or monitoring methods required in this permit;
- 1.9.4. Sample or require that a sample be drawn, under EPA, USCG, or ASEPA supervision, of any materials discharged or to be discharged; or
- 1.9.5. Inspect laboratory facilities, data, and quality control records required for compliance with any condition of this permit.
- 1.10. Material which is regulated by this permit may be disposed of, due to an emergency, to safeguard life at sea in locations or in a manner that does not comply with the terms of this permit. If this occurs, the permittee shall make a full report, according to the provisions of 18 U.S.C. § 1001, within 15 days to the EPA Regional Administrator, the USCG and the ASEPA describing the conditions of this emergency and the actions taken, including the location, the nature and the amount of material disposed.
- 1.11. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of rights, nor any infringement of Federal, State or local laws or regulations, nor does it obviate the necessity of obtaining State or local assent required by applicable law for the activity authorized.
- 1.12. This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities, or, except as authorized by this permit, the conduct of any work in any navigable waters.
- 1.13. Unless otherwise provided for herein, all terms used in this permit shall have the meanings assigned to them by the Act or 40 C.F.R. Parts 220 through 228, issued thereunder.

2. SPECIAL CONDITIONS - DISPOSAL SITE AND FISH PROCESSING WASTE CHARACTERIZATION

Special conditions are necessary to define the length of the permit period, identify the disposal site location, describe fish processing waste streams and define maximum permitted limits for DAF Sludge, Cooker Juice and Press Liquor.

2.1. Location of the Waste Generator and Duration of the Permit

- 2.1.1. The material to be dumped shall consist of fish processing wastes, defined in Special Conditions 2.3 and 2.4, generated at the permittee's fish cannery in Pago Pago, American Samoa.
- 2.1.2. This permit shall become effective on September 1, 1993 and it shall expire three years from the effective data at midnight on August 31, 1996.

2.2. Location of Disposal Site

Disposal of fish processing wastes generated at the location defined in Special Condition 2.1.1 shall be confined to a circular area with a 1.5 nautical mile radius, centered at 14° 24.00' South latitude by 170° 38.30' West longitude.

2.3. Description of Fish Processing Wastes

2.3.1. During the term of this permit, and according to all other terms and conditions of this permit, the permittee is authorized to transport and dispose a maximum of 200,000 gallons per day of fish processing wastes pumped from a storage tank on the permittee's premises. The fish processing wastes pumped from the permittee's storage tank are authorized for disposal at the designated ocean disposal site. Fish processing wastes pumped into the permittee's onshore storage tanks shall not exceed the following amounts:

Table 2. Volumes of Fish Processing Wastes Generated Each Day by StarKist Samoa and Pumped into a Storage Tank before Loading into the Ocean Disposal Vessel.

Fish Processing Waste	Maximum Volume Generated (gallons/day)
Dissolved Air Flotation (DAF) Sludge	30,000
Cooker Juice	70,000 ·
Press Liquor	100,000
Maximum Daily Volume Generated and Pumped into a Storage Tank before Loading into the Disposal Vessel	200,000

2.4. Fish Processing Waste Stream Limits

Physical or Chemical Parameter (units)*	DAF Sludge	Cooker Juice	Press Liquor
Total Solids (mg/L)	163,430	114,180	327,870
Total Volatile Solids (mg/L)	136,180	63,400	292,280
5-Day BOD (mg/L)	232,320	185,150	310,790
Oil and Grease (mg/L)	64,100	11,810	112,080
Total Phosphorus (mg/L)	1,640	940	3,160
Total Nitrogen (mg/L)	7,020	7,560	20,360
Ammonia (mg/L)	1,830	69 0	1,390
pH (pH units)	5.3 to 7.0	5.9 to 7.0	5.8 to 7.0
Density (g/mL)	0.97 to 1.06	0.98 to 1.06	0.99 to 1.08

- a = All calculated values were rounded to the nearest 10, except density and pH ranges.
- 2.4.2. Permitted Maximum Concentrations for each type of fish processing waste stream were calculated based on an analysis of historical data from the permittee's previous Special Ocean Dumping Permit, number OD 90-01. The calculations followed EPA's recommended procedure for determining permit limits as defined in the EPA document titled: "Guidance Document for Ocean Dumping Permit Writers" (January 30, 1988). EPA Region IX will periodically review these limits during the permit to evaluate the accuracy of the limits. If revisions are necessary, EPA Region IX will make changes according to the authority defined in the Ocean Dumping Regulations at 40 C.F.R §§ 223.2 through 223.5.
- 2.4.3. The Permitted Maximum Concentrations, density range and pH range listed above, shall not be exceeded at any time during the term of this permit.

3. SPECIAL CONDITIONS - ANALYSIS OF FISH PROCESSING WASTES

Compliance with the permitted maximum concentrations defined in Special Condition 2.4 shall be determined by monthly monitoring of each of the fish processing waste streams. Additional analyses of fish processing wastes and reporting requirements are defined in this section. Any fish processing waste stream sampling dates shall be scheduled

within the first two weeks of the month to allow enough time for laboratory analyses and report writing to comply with Special Condition 3.3.

3.1. Analyses of Fish Processing Wastes

3.1.1. Concentrations or values of the parameters listed in Special Condition 2.4 and those listed in the table below shall be determined for each fish processing waste stream. A sample of each fish processing waste stream shall be taken before the individual streams are mixed and pumped into an onshore storage tank. A sample shall consist of three replicate grab samples, taken on the day that sampling is scheduled, pooled for use as a composite sample. The detection limits specified in Table 4 shall be used in all fish processing waste stream analyses.

Table 4. Physical and Chemical Parameters to be Analyzed from Individual Samples of DAF Sludge, Cooker Juice and Press Liquor.

Parameter	Method Detection Limit	
Total Solids	10.0 mg/L	
Total Volatile Solids	10.0 mg/L	
5-Day BOD	10.0 mg/L	
Oil and Grease	10.0 mg/L	
Total Phosphorus	1.0 mg/L	
Total Nitrogen	1.0 mg/L	
Ammonia	1.0 mg/L	
рН	0.1 pH units	
Density	0.01 g/mL	

- 3.1.2. In addition to the fish processing waste stream samples taken under Special Condition 3.1.1, the permittee shall analyze samples taken from its onshore fish processing waste storage tank during the transfer of these wastes to the disposal vessel's holding tanks.
 - 3.1.2.1. Three samples shall be taken from the onshore storage tank transfer line at 10 minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee.

- 3.1.2.2. Samples described in Special Condition 3.1.2.1 shall be taken for 12 months. Samples shall be collected on the same day that samples are taken for analysis under Special Condition 3.1.1 and another sample shall be taken one week later.
- 3.1.2.3. The same parameters and detection limits listed in Table 4 shall be analyzed and used for the onshore storage tank composite samples. This sampling and analysis program will provide 2 samples per month for 12 months yielding 24 samples.
- 3.1.2.4. The permittee shall send a copy of the analytical data for the onshore storage tank samples to EPA Region IX every 3 months during the 12-month sampling period. EPA Region IX will use these results to calculate limits for the onshore storage tank fish processing wastes. When the onshore storage tank limits are calculated, EPA Region IX will evaluate whether to amend this permit using the new limits.
- 3.1.3. All sampling procedures, analytical protocols, and quality control/quality assurance procedures shall be performed according to guidelines specified by EPA Region IX. The following references shall be used by the permittee:
 - 3.1.3.1. 40 C.F.R. Part 136, EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act;
 - 3.1.3.2. Tetra Tech, Incorporated. 1985. Summary of U.S. EPA-approved Methods, Standard Methods and Other Guidance for 301(h) Monitoring Variables. Final program document prepared for the Marine Operations Division, Office of Marine and Estuarine Protection, U.S. Environmental Protection Agency. EPA Contract No. 68-01-693. Tetra Tech, Incorporated, Bellevue, Wa.; and
 - 3.1.3.3. Environmental Protection Agency. 1987. Quality Assurance and Quality Control for 301(h) Monitoring Programs: Guidance on Field and Laboratory Methods. Office of Marine and Estuarine Protection, Washington, D.C. EPA 430/9-86-004.

3.2. Analytical Laboratory

3.2.1. Within 30 days of the effective date of this permit, the name and address of the contract laboratory or laboratories and a description of all analytical test procedures and quality assurance/quality control procedures, including detection limits being used, shall be provided for EPA Region IX approval.

- 3.2.2. Any potential variation or change in the designated laboratory or analytical procedures shall be reported, in writing, for EPA Region IX approval.
- 3.2.3. EPA Region IX may require analyses of quality control samples by any laboratories employed to comply with Special Condition 3.1 and Appendix A. Upon request, the permittee shall provide EPA Region IX with the analytical results from such samples.
- 3.2.4. A complete analysis of parameters, required in Special Condition 3.1, shall be made by the permittee and reported to EPA Region IX and the ASEPA whenever there is a significant change in the quality of a fish processing waste stream as determined by EPA Region IX or the ASEPA. If necessary, bioassays may be required in addition to parameter analyses.

3.3. Reporting

- 3.3.1. The permittee shall provide EPA Region IX, ASEPA, the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS) and the Western Pacific Regional Fishery Management Council (WPRFMC) with a report, prepared every 3 months during the permit period, that contains the following information:
 - 3.3.1.1. Daily volumes of DAF Sludge, Cooker Juice and Press Liquor generated at the permittee's facility and pumped into the permittee's onshore storage tanks. These volumes shall be reported in gallons per day using Form 1 (see Appendix B);
 - 3.3.1.2. Daily volumes of fish processing wastes disposed at the ocean disposal site. These volumes shall be reported in gallons per day using Form 1 (see Appendix B);
 - 3.3.1.3. Monthly fish processing waste stream analyses demonstrating that the fish processing wastes being dumped comply with the permitted limits of parameters listed in Special Condition 2.4 and a summary of the volumes of fish processing wastes disposed at the ocean site using Form 2 (see Appendix B);
 - 3.3.1.4. The monthly amount of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams reported in pounds per month (see Forms 1 and 2).
- 3.3.2. Such reports, including a comparison with the permit limits as required on Forms 1 and 2, shall be submitted to EPA Region IX, ASEPA, NMFS USFWS and WPRFMC within 45 days of the end of the preceding 3-month period for which they were prepared. The reports shall be submitted within this time unless extenuating circumstances are communicated to EPA Region IX and the ASEPA in writing. In addition to a hard copy of Forms 1 and 2, the data

contained on Form 1 shall be submitted to EPA Region IX on a 3.5" computer diskette in a format compatible with LOTUS version 2.2.

- 3.3.3. A summary report of all 3-month reports listed in Special Condition 3.3.1, including a comparisons with permit limits and a detailed discussion of the summary results, shall be submitted by the permittee to EPA and the ASEPA 45 days after the permit expires. All fish processing waste stream data shall be reported in the same format as required in Special Condition 3.3.2.
- 3.3.4. Upon detection of a violation of any permit condition, the permittee shall send a written notification of this violation to EPA Region IX and the ASEPA within five working days and a detailed written report of the violation shall be sent to the agencies within 15 working days. This notification shall pertain to any permit limits (defined in Special Condition 2.4) that are exceeded, violation of volume limits (defined in Table 2 under Special Condition 2.3.1), and any disposal operation that occurs outside the disposal site defined in Special Condition 2.2.
- 3.3.5. Eighteen months from the effective date of this special permit, the permittee shall submit a report to EPA and ASEPA on the results of suspended phase bioassay tests and reevaluation of the model used to predict the concentrations of fish processing wastes disposed at the designated site. The suspended phase bioassays shall be conducted using at least one species from each of the following three groups: Group 1 = Mytilus sp. (mussel), Crassostrea sp. (oyster), Acartia tonsa (copepod), or Trypneustes sp. (sea urchin) larvae; Group 2 = Holmesimysis costata (mysid shrimp) or Penaeus vannamei (white shrimp); and Group 3 = Citharicthys stigmaeus (speckled sanddab) or Coryphaena hippurus (dolphinfish) juveniles.

Appropriate suspended phase bioassay protocols, either protocols approved by EPA or protocols published by the American Society for Testing and Materials (ASTM), shall be followed. Suspended particulate phase bioassays shall be run using the following fish processing waste concentrations: 100%, 75%, 50%, 25%, 10%, 5%, and a control (0%). A minimum of five replicates are required per dilution concentration. Concurrent reference toxicant tests shall be conducted when the suspended phase bioassays are run.

A sampling and testing plan shall be submitted to EPA Region IX and ASEPA by October 1, 1993 for approval before the bioassay tests are conducted. Samples for the suspended particulate phase bioassays shall be composited from the permittee's onshore storage tanks. Three samples shall be taken from the onshore storage tank transfer line at 10 minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee. The permittee shall take samples on the following dates: November 30, 1993, February 28, 1994 and May 31, 1994. Samples shall be collected and shipped to the testing laboratory according to EPA-approved methods to

ensure that the samples do not change before the bioassay tests begin. All suspended particulate phase bioassays shall be started within 10 days of sampling.

The testing plan submitted by October 1, 1993 should also include a proposal to reevaluate the disposal site model using results obtained from the new series of suspended phase bioassays. These bioassays are being required to confirm the toxicity of the fish processing wastes and to reevaluate the disposal operations based on the use of a different disposal vessel.

The bioassay and computer model confirmation report shall contain the following information:

3.3.5.1. INTRODUCTION AND PROJECT DESCRIPTION

The project description should include the following information about fish processing waste toxicity, previous bioassay test results, previous modelling at the ocean disposal site, and the design of the new bioassay tests.

3.3.5.2. MATERIALS AND METHODS

Fish processing waste sampling and sample handling procedures should be described or referenced.

References for laboratory protocols for suspended phase bioassay tests.

- 1) EPA-approved methods and references.
- 2) Test species used in each test, the supplier or collection site for each test species, and QA/QC procedures for maintaining the test species.
- 3) Source of seawater used in reference, control and bioassay tests.
- 4) Data and statistical analysis procedures.
- 5) Limiting Permissible Concentration (LPC) calculations.
- 6) Description of model selected to evaluate dispersal of fish processing wastes at the ocean disposal site. Use of this model shall be approved by EPA Region IX and ASEPA before it is used by the permittee to evaluate the fish processing waste disposal plume.

3.3.5.3. DESCRIPTION OF SAMPLING PROCEDURES

QA/QC procedures and actual sampling procedures used during fish processing waste stream sampling and handling of the samples.

3.3.5.4. FINAL RESULTS, ANALYSIS OF DATA AND DISCUSSION

- 1) Complete bioassay data tables and summary bioassay tables shall be furnished in the report. All data tables should be typed or produced as a computer printout.
- 2) The permittee shall analyze the bioassay data and calculate the LPC of the material as defined at 40 C.F.R. § 227.27(a-b).
- 3) The permittee shall use the LPC in the approved plume model to determine the concentration of fish processing wastes disposed at the designated ocean disposal site which complies with EPA's Ocean Dumping Criteria defined at 40 C.F.R. Parts 227 and 228.

3.3.5.5. REFERENCES

This list should include all references used in the field sampling program, laboratory protocols, LPC calculations, modelling analyses, and historical data used to evaluate the fish processing waste disposal operations at the designated ocean disposal site.

3.3.5.6. DETAILED QA/QC PLANS AND INFORMATION

The following topics should be addressed in the QA Plan:

- 1) QA objectives.
- 2) Organization, responsibilities and personnel qualifications, internal quality control checks.
- 3) Sampling and analytical procedures.
- 4) Equipment calibration and maintenance.
- 5) Sample custody and tracking.
- 6) documentation, data reduction, and reporting.
- 7) Data validation.
- 8) Performance and systems audits.
- 9) Corrective action.
- 10) Reports.

4. SPECIAL CONDITIONS - VESSEL OPERATIONS

Specifications for vessel operations are defined to limit dumping activities to the dump site identified in Special Condition 2.2 and to record all dumping activities. The permittee's fish processing wastes and fish processing wastes of other authorized permittees may be loaded into the disposal vessel together or separately.

4.1. Posting of the Permit

This permit, or a true copy thereof, shall be placed in a conspicuous place on any vessel which is used for the transportation and dumping authorized by this permit.

4.2. Vessel Identification

Every vessel engaged in the transportation of fish processing wastes for ocean disposal shall have its name and number painted in letters and numbers at least fourteen (14) inches high on both sides of the vessel. The name and number shall be kept distinctly legible always, and a vessel without such markings shall not be used to transport or dump fish processing wastes.

4.3. Determination of the Disposal Location Within the Dump Site

On each disposal trip, the master of the disposal vessel shall determine the location of the disposal operation as follows:

- 4.3.1. The disposal vessel, as defined under WASTE TRANSPORTER on page 1 of this permit, shall proceed directly to the center of the disposal site at the location specified in Special Condition 2.2.
- 4.3.2. The master of the vessel shall observe the conditions at the dump site center, noting the vessel's position (latitude and longitude), wind direction and observed surface current direction.
- 4.3.3. After the conditions defined in Special Condition 4.3.2 have been recorded, the master of the disposal vessel shall proceed 1.1 nautical miles up current from the center of the disposal site and record the position of the disposal vessel (latitude and longitude). This position shall be the starting point for disposal operations for each disposal trip.
- 4.3.4. The master of the disposal vessel shall prepare a hard copy (on 8.5 inch by 11 inch paper) of the computerized navigational plot documenting compliance with the procedures defined in Special Conditions 4.3.1 through 4.3.4. The hard copy of the computerized navigational plot for each disposal trip shall be supplied to the permittee. The permittee shall submit these hard copies of the computerized navigational plots with the 3-month reports required under Special Condition 3.3.1. The hard copies of the navigational plots shall include:

- 4.3.4.1. The disposal vessel's course during the entire dumping operation; and
- 4.3.4.2. The times and location of entry and exit from the disposal site, position and time of arrival at the center of the disposal site, position and time of arrival at the location 1.1 nautical miles up current from the disposal site, beginning and ending of dumping operations, and disposal vessel position plotted every 15 minutes while dumping operations occur.
- 4.3.5. The master of the disposal vessel shall sign and date each hard copy of the computerized navigational plots certifying that the hard copies are an accurate record of the disposal vessel's track for each disposal trip.
- 4.3.6. The master of the disposal vessel shall certify that disposal operations occurred in the manner required by the permit.
- 4.3.7. The procedures listed in Special Conditions 4.3.1 through 4.3.6 shall be repeated for each disposal trip.

4.4. Disposal Rate and Vessel Speed

- 4.4.1. The disposal vessel/barge shall discharge the material authorized by this permit beginning at the disposal location as determined by Special Condition 4.3.3. The vessel track shall be in a direction that is perpendicular to the current detected at the center of the disposal site as defined in Special Condition 2.2. Disposal shall occur in a oval shape along an axis at least 0.5 nautical miles on either side of the starting point determined in Special Condition 4.3.3. The entire disposal vessel track shall be within the disposal site boundaries.
 - 4.4.1.1. From June 1 through November 30, fish processing wastes shall be pumped from the disposal vessel into the ocean at a rate of 140 gallons per minute per knot, not to exceed 1,400 gallons per minute at a maximum speed of 10 knots.
 - 4.4.1.2. From December 1 through May 31, fish processing wastes shall be pumped from the disposal vessel into the ocean at a rate of 120 gallons per minute per knot, not to exceed 1,200 gallons per minute at a maximum speed of 10 knots.

4.5. Computerized Navigational System

The permittee shall use an onboard computerized electronic positioning system to fix the position of the disposal vessel accurately during all dumping operations. The computerized navigational system and the method to produce a 8.5 inch by 11 inch hard copy of each disposal trip must be approved by EPA Region IX and the USCG Liaison Office (CGLO) Pago Pago. The permittee shall submit the description, specifications and example

hard copy plots for the computerized navigational system at least 15 working days before the effective date of the permit. Disposal operations shall not begin until EPA Region IX and CGLO Pago Pago provide the permittee with written approval for the computerized navigation system and the hard copy plots.

4.6. Permitted Times for Disposal Operations

Dumping operations shall be restricted to daylight hours, unless an emergency exists as defined at 40 C.F.R. § 220.1(c)(4). ASEPA and CGLO Pago Pago shall be notified immediately if an emergency exists and ocean disposal is required to protect human life at sea. No later than 5 working days after the emergency, the permittee and the waste transporter shall provide EPA Region IX, ASEPA and CGLO Pago Pago with a detailed written report on the emergency situation.

4.7. Reporting of the Ocean Dumping Vessel Operations

- 4.7.1. The waste transporter shall maintain and the permittee shall submit copies of a daily transportation and dumping log, including hard copy plots of all information required in Special Conditions 4.3 and 4.7.2. Copies of the daily logs shall be sent to EPA Region IX, CGLO Pago Pago, and the ASEPA as part of the 3-month report.
- 4.7.2. The logbook shall contain the following information for each disposal trip:
 - 4.7.2.1. Permit number, date and consecutive trip number;
 - 4.7.2.2. Record of contact with ASEPA and CGLO before each trip to the ocean disposal site.
 - 4.7.2.3. The time when loading of the vessel commences and ceases in Pago Pago Harbor;
 - 4.7.2.4. The volume of fish processing waste loaded into the disposal vessel from each fish cannery;
 - 4.7.2.5. The time and navigational position that dumping commences and ceases;
 - 4.7.2.6. A record of vessel speed and direction every 15 minutes during each dumping operation at the disposal site, and a hard copy of the vessel's course defined in Special Condition 4.3;
 - 4.7.2.7. Discharge rate from the disposal vessel.
 - 4.7.2.8. Observe, note and plot the time and position of any floatable material;

- 4.7.2.9. Observe, note and plot the wind speed and direction every 30 minutes while dumping fish processing wastes at the designated disposal site;
- 4.7.2.10. Observe and note current direction at the beginning and end of the disposal trip, and the direction of the disposal plume at the end of the disposal operation;
- 4.7.2.11. Observe, note and plot the presence of the previous disposal plume and any unusual occurrences during the disposal trip, or any other information relevant to the assessment of environmental impacts as a result of dumping activities; and
- 4.7.2.12. Any unusual occurrences noted under Special Condition 4.7.2.9 shall be highlighted in the report defined in Special Condition 3.3.1.

5. SPECIAL CONDITIONS - DUMP SITE MONITORING

The monitoring program for disposal of fish processing wastes in the ocean must document effects of disposed wastes on the receiving waters, biota, and beneficial uses of the receiving waters; compliance with EPA's Ocean Dumping Regulations; and determine compliance with permit terms and conditions. Revisions to the monitoring program may be made under the direction of EPA Region IX at any time during the permit term, in compliance with 40 C.F.R. §§ 223.2 and 223.3. This may include a change in the number of parameters to be monitored, the frequency of monitoring, the location of sample stations, or the number and size of samples to be collected.

Implementation of the disposal site monitoring program and all segments of the monitoring program specified in Special Condition 5 and Appendix A shall be the responsibility of the permittee.

5.1. Monitoring Program

The permittee shall conduct the monitoring program, defined in Appendix A, to determine the environmental impacts of ocean dumping of fish processing waste. If possible, monitoring cruises shall be scheduled within the first two weeks of each month to allow enough time for laboratory analysis and report writing in compliance with Special Condition 5.2. The permittee shall notify the ASEPA at least 48 hours before any scheduled monitoring activities.

5.2. Monitoring Reports

Monthly site monitoring reports shall be submitted to EPA Region IX, the ASEPA, NMFS, USFWS and WPRFMC with the 3-month reports as specified in Special Condition 3.3.2. The reports shall include: neatly compiled raw data for all sample analyses, quality assurance/quality control data, statistical analysis of sample variability

between stations and within samples for each parameter, and a detailed discussion of the results.

5.3. Final Summary Report

- 5.3.1. A report shall be submitted to EPA Region IX, ASEPA, NMFS, USFWS and WPRFMC 60 days after the permit expires. This report shall summarize all of the data collected to characterize fish processing wastes and the results of the dump site monitoring program specified in this special permit.
- 5.3.2. At a minimum, the summary report shall contain the following sections:
 - 5.3.2.1. Introduction (including a summary of previous ocean disposal activities),
 - 5.3.2.2. Location of Sampling Sites,
 - 5.3.2.3. Materials and Methods,
 - 5.3.2.4. Results and Discussion (including comparisons and contrasts with previous MPRSA § 102 research and special permit data related to disposal of fish processing wastes off American Samoa),
 - 5.3.2.5. Conclusions; and
 - 5.3.2.6. References.

5.4. Quality Assurance/Quality Control

- 5.4.1. All appropriate phases of the monitoring, sampling, and laboratory analytical procedures shall comply with the EPA Region IX-specified protocols and references listed in Special Condition 3.1.2.
- 5.4.2. The qualifications of the on-site Principal Investigator in charge of the field monitoring operation at the dump site shall be submitted to EPA Region IX and the ASEPA for approval before the initial monitoring cruise. Notification of any change in this individual shall be submitted to EPA Region IX and ASEPA at least 7 days before the cruise is scheduled.

6. SPECIAL CONDITIONS - NOTICE TO REGULATORY AGENCIES

- 6.1. Notice of Sailing to the U.S. Coast Guard Liaison Office and the American Samoa Environmental Protection Agency
 - 6.1.1. The waste transporter shall provide telephone notification of sailing to CGLO Pago Pago at 633-2299 and the ASEPA at 633-2304 during working hours

(7:00 a.m. to 3:30 p.m.) no later than 24 hours before the estimated time of departure for the dump site defined in Special Condition 2.2. A record of contact with both agencies shall be reported with other information for each disposal trip.

- 6.1.2. The waste transporter shall immediately notify CGLO Pago Pago and the ASEPA upon any changes in the estimated time of departure greater than two hours.
- 6.1.3. Surveillance of activities at the dump site designated in Special Condition 2.2, may be accomplished by unannounced aerial overflights, a USCG shiprider and/or a ASEPA shiprider who will be on board the towing/conveyance vessel for the entire voyage. Within two hours after receipt of the initial notification the waste transporter will be advised whether or not a shiprider will be assigned to the waste transporter's disposal vessel.
- 6.1.4. The following information shall be provided to CGLO Pago Pago and the ASEPA in the notification of sailing defined above:
 - 6.1.4.1. The time of departure,
 - 6.1.4.2. Estimated time of arrival at the dump site,
 - 6.1.4.3. Estimated time of departure from the dump site, and
 - 6.1.4.4. Estimated time of return to port.

6.2. Reports and Correspondence

6.2.1. Two copies of all reports and related correspondence required by General Condition 1.10, Special Conditions 3.2, 3.3, 4.3, 4.5, 4.6, 4.7, 5.2, 5.3, 6.1, and all other materials, including applications shall be submitted to EPA Region IX at the following address:

Office of Pacific Island and Native American Programs (E-4) U.S. Environmental Protection Agency, Region IX 75 Hawthorne Street San Francisco, California 94105-3901 Telephone (415) 744-1594

6.2.2. Two copies of all reports required by General Condition 1.10 and Special Conditions 4.5, 4.6, 4.7 and 6.1 sent to the U.S. Coast Guard shall be submitted to the following address:

Commanding Officer
U.S. Coast Guard Liaison Office
P.O. Box 249
Pago Pago, American Samoa 96799
Telephone (684) 633-2299

6.2.3. Three copies of all reports required by General Condition 1.10 and Special Conditions 3.2, 3.3, 4.3, 4.5, 4.6, 4.7, 5.2, 5.3, and 6.1 sent to the American Samoa Environmental Protection Agency shall be submitted to the following address:

Director American Samoa Environmental Protection Agency Office of the Governor Pago Pago, American Samoa 96799 Telephone (684) 633-2304

6.2.4. One copy of the all reports required by Special Conditions 3.3, 5.2 and 5.3 shall be sent to the USFWS, the NMFS and the WPRFMC at the following addresses:

Project Leader
Office of Environmental Services
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard
P.O. Box 50167
Honolulu, Hawaii 96850

Western Pacific Program Officer National Marine Fisheries Service 2570 Dole Street Honolulu, Hawaii 96822-2396

Executive Director
Western Pacific Regional Fishery Management Council
1164 Bishop Street, Suite 1405
Honolulu, Hawaii 96813

Signed this 23 day of 3 (4445, 1993)

For the Regional Administrator:

Harry Seraydarian, Director Water Management Division

U.S. EPA, Region IX

APPENDIX A

SPECIAL OCEAN DUMPING PERMIT OD 93-01 OCEAN DUMP SITE MONITORING PLAN

7. MONITORING OF RECEIVING WATER

Monitoring of the receiving waters at the disposal site defined in Special Condition 2.2 shall be the responsibility of the permittee. Funding and cooperation for site monitoring may be accomplished through an agreement between permittee and other permittees authorized to use the disposal site. Any agreements negotiated between the permittee and other authorized permittees shall be the sole responsibility of the permittee named in this permit. EPA Region IX requires that a monitoring program be developed that complies with the special conditions defined below.

During each monitoring cruise, the disposal plume from the disposal vessel shall be sampled by taking discrete water samples for the measurement of parameters listed in Special Condition 7.2.4. Results of the first 3-month monitoring report will be evaluated by EPA Region IX to determine whether portions of Special Conditions 7 and/or 8 will be revised. The evaluation will be based on documented sampling results and recommendations by the permittee(s).

7.1. Location of Water Sampling Stations

- 7.1.1. On each sampling cruise, the latitude and longitude of all sampling stations shall be determined and plotted using an acceptable navigational system.
- 7.1.2. The Principal Investigator shall ensure that discrete water samples are taken at the locations marked in Figure 1.

				Prevailing Surface Current Direction			
5 Leading Edge of Plume	4 1.0 nmi	3 0.5 nmi	2 0.25 nmi	1 Starting			

Figure 1. Orientation of Sample Stations (Top View) in the Middle of the Discharge Plume Visually Identified at the Time of Sampling.

- 7.1.3. The following stations, defined in Figure 1, shall be sampled on each sampling cruise:
 - 7.1.4.1. Station 1 shall be the starting point of the dumping operation as determined in Special Condition 4.3.

- 7.1.4.2. Station 2 shall be 0.25 nautical miles (nmi) down-current from Station 1.
- 7.1.4.3. Station 3 shall be 0.5 nmi down-current from Station 1.
- 7.1.4.4. Station 4 shall be 1.0 nmi down-current from Station 1.
- 7.1.4.5. Station 5 shall be at the leading edge of the discharge plume, but within the plume.
- 7.1.4. The Principal Investigator shall ensure that each sampling station is positioned as close as possible to the middle of the discharge plume according to his/her best professional judgment.

7.2. Water Column Characteristics to Be Measured

- 7.2.1. Discrete water samples at Stations 1, 2, 3, 4, and 5 shall be taken at depths of 1, 3, and 10 meters from the surface at the middle of the plume visually identified by the Principal Investigator.
- 7.2.2. Surface water conditions shall be recorded at all stations including:
 - 7.2.2.1. Wind speed and direction;
 - 7.2.2.2. Current direction and wave height; and
 - 7.2.2.3. Observations of plume color (e.g., Forel-Ule color scale), odor, floating materials, grease, oil, scum, and foam.
- 7.2.3. Water samples shall be obtained using a self-closing 3-liter water sample device at each depth listed in 7.2.1.
- 7.2.4. Water column parameters analyzed from discrete samples taken at the depths listed in 7.2.1 shall include:

Table 4. Physical and Chemical Parameters to be Analyzed from Water Samples Taken at the Ocean Disposal Site.

Parameter ^a	Method Detection Limit
Total Suspended Solids	10.0 mg/L
Total Volatile Suspended Solids	10.0 mg/L
Oil and Grease .	10.0 mg/L

Parameter*	Method Detection Limit
Total Phosphorus	1.0 mg/L
Total Nitrogen	1.0 mg/L
Ammonia	1.0 mg/L
pН	0.1 pH units

a = Samples should be acidified to pH <2 with sulfuric acid and refrigerated a 4°C until analysis.

7.2.5. Temperature measurements shall be taken at depths of 1, 3, and 10 meters at the starting point of the disposal operation, as defined in Special Condition 4.3.3.

7.3. Frequency of Sampling

- 7.3.1. Water samples shall be collected when dumping operations occur. Each station listed under Special Condition 7.1 shall be sampled once each month. These samples shall be used to characterize the receiving waters at the disposal site.
- 7.3.2. Control samples shall be taken at Station 1 before dumping activities.
- 7.3.3. Station 1 shall be sampled at a point within the plume immediately after discharge operations cease.
- 7.3.4. Stations 2 through 5 shall be sampled consecutively at distances indicated in Special Condition 7.1.4 to allow efficient sampling of the discharge plume. The time between each sample and the sampling location, beginning with the control sample and ending with the sample collected at the leading edge of the plume, shall be recorded.

7.4. Water Quality Criteria and Standards

7.4.1. The LPC of the liquid phase of the fish processing wastes shall not be exceeded at the disposal site boundary four hours after disposal operations cease. The LPC, as defined at 40 C.F.R. §227.27, shall not exceed applicable American Samoa Oceanic Water Quality Standards (see Table 1). EPA Region IX and the ASEPA will evaluate the LPC based on EPA's Ocean Dumping Regulations and the concentration of parameters measured at the stations sampled during the tenure of this permit.

8. MONITORING OF BIOLOGICAL COMMUNITIES

8.1. Pelagic Resources

- 8.1.1. All sightings of fish, sea turtles, sea birds, or cetaceans near the disposal site shall be recorded including:
 - 8.1.1.1. Time, location and bearing;
 - 8.1.1.2. Species name(s); and
 - 8.1.1.3. Approximate number of individuals.

PENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month	19

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
					·	
		·				

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
Monthly Totals						

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthl	y quantities	of alur	n (aluminum	sulfate)	and	coagulant	polymer	added	to	the	tish	processing	waste	streams:

Aluminum sulfate: _____ pounds/month

Coagulant polymer: _____ pounds/month

APPENDIX B - REPORT FORM 2

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA § 102 Permit #OD 93-01

Reporting Period: From	19)	To	19	
• 0				-	_

StarKist Samoa - Dissolved Air Flotation (DAF) Sludge

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitro gen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
OD 93-01 Permit Limits	163,430	136,180	232,320	64,100	1,640	7.020	1,830	5.3 to 7.0	0.97 to 1.06

StarKist Samoa - Cooker Juice

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitro gen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
OD 93-01 Permit Limits	114,180	63,400	185,150	11,810	940	7,560	690	5.9 to 7.0	0.98 to 1.06

StarKist Samoa - Press Liquor

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitro gen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
OD 93-01 Permit Limits	327,870	292.280	310,790	112,080	3,160	20,360	1,390	5.8 to 7.0	0.99 to 1.08

NOTE: An asterisk (*) next to the waste concentration signifies that a violation of the permit limit has occurred.

Cumulative Yearly Data on Fish Processing Wastes Generated at StarKist Samoa's Plant and Disposed at the Ocean Site. MPRSA §102 Special Permit #OD 93-01

Reporting Per	iod: From	19	To	19)

Month & Year	DAF Sludge Generated (gallons/month)	Cooker Water Generated (gallons/month)	Press Liquor Generated (gallons/month)	Total Generated (gallons/month)	Aluminum suifate (pounds/month)	Coagulant polymer (pounds/month)	Volume Ocean Disposed (gallons/month)
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•							
Cumulative Yearly Totals							

NOTE: A separate table shall be prepared for each calendar year.

MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT § 102 OCEAN DUMPING PERMIT

PERMIT NUMBER AND TYPE: OD 93-01 Special

EFFECTIVE DATE: July 31 September 1, 1993

EXPIRATION DATE: July 31 August 31, 1996

PERMITTEE: StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

WASTE GENERATOR: StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

WASTE GENERATED AT: StarKist Samoa, Inc.

P.O. Box 368

Pago Pago, American Samoa 96799

PORT OF DEPARTURE: Pago Pago Harbor, American Samoa

WASTE TRANSPORTER: FV TASMAN SEA

Blue North Fisheries, Inc. 1130 N.W. 45th Street

Seattle, Washington 98107-4626

A special ocean dumping permit is being issued to StarKist Samoa, Inc. because the Regional Administrator of EPA Region IX has determined that disposal of fish processing wastes off American Samoa meets EPA's ocean dumping criteria at 40 C.F.R. Parts 227 and 228. For this permit, the term "fish processing wastes" shall mean eitherrefer to Dissolved Air Flotation (DAF) Sludge, Cooker Juice orand Press Liquor generated at the permittee's plant in Pago Pago, American Samoa; or any combination of the three waste streams pumped from StarKist Samoa's onshore holding tanks into the ocean disposal vessel for transportation to the ocean disposal site.

This special permit authorizes the transportation and dumping into ocean waters of fish processing wastes as described in the special conditions section pursuant to the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 (33 U.S.C. § 1401 et seq.) as amended (hereinafter referred to as "the Act"); regulations issued thereunder; and the terms and conditions stated below.

This MPRSA Special Permit does not contain any information collection requirements subject to Office of Management and Budget review under the Paper Work Reduction Act of 1980 (44 U.S.C. § 3501 et seq.). This determination has been made because the permit does not require data collection by more than 10 persons.

1. GENERAL CONDITIONS

- 1.1. Operation under this special ocean dumping permit shall conform to all applicable federal statutes and regulations including, but not limited to, the Act, the Ocean Dumping Ban Act of 1988 (P.L. 100 688), the Marine Plastic Pollution Research and Control Act of 1987 (P.L. 100-220), the Clean Water Act (33 U.S.C. § 1251 et seq.), and the Ports and Waterways Safety Act (33 U.S.C. § 1221 et seq.).
- 1.2. All transportation and dumping authorized herein shall be undertaken in a manner consistent with the terms and conditions of this permit. StarKist Samoa, Inc. (hereafter referred to as "the permittee") shall be liable for compliance with all such terms and conditions. The permittee shall be held liable under § 105 of the Act (33 U.S.C. § 1415) if any permit violations occur. During disposal operations when the permittee's fish processing wastes are loaded aboard the disposal vessel in holding tanks, either separately or combined with similar fish processing wastes from other permittees authorized to use the ocean disposal site defined in Special Condition 2.2, all companies the permittees shall be held individually liable under § 105 of the Act (33 U.S.C. § 1415) if a permit violation occurs. If a permit violation occurs during the transportation and disposal of fish processing wastes, the waste transporter may also be liable for permit violations.
- 1.3. Under § 105 of the Act, any person who violates any provision of the Act, 40 C.F.R. Parts 220 through 228 promulgated thereunder, or any term or condition of this permit shall be liable for a civil penalty of not more than \$50,000 per day for each violation. Additionally, any knowing violation of the Act, 40 C.F.R. Parts 220 through 228, or the permit may result in a criminal action being brought with penalties of not more than \$50,000 or one year in prison, or both. Violations of the Act or the terms and conditions of this permit include but are not limited to:
 - 1.3.1. Transportation to, and dumping at any location other than that defined in Special Condition 2.2 of this permit;
 - 1.3.2. Transportation and dumping of any material not identified in this permit, more frequently than authorized in this permit, or more than the quantities identified in this permit, unless specifically authorized by a written modification hereto;
 - 1.3.3. Failure to conduct permit monitoring as required in Special Conditions 3.1, 3.3.1, 4.7 and 5.1; or
 - 1.3.4. Failure to file reports on fish processing wastes stream reports and disposal site monitoring reports as required in the Special Conditions 3.3, 4.7, 5.2 and 5.3.

- 1.4. Nothing contained herein shall be deemed to authorize, in any way, the transportation from the United States for the purpose of dumping into the ocean waters, the territorial sea, or the contiguous zone, the following materials:
 - 1.4.1. High-level radioactive wastes;
 - 1.4.2. Materials, in whatever form, produced for radiological, chemical, or biological warfare;
 - 1.4.3. Persistent synthetic or natural materials which may float or remain in suspension in the ocean; or
 - 1.4.4. Medical wastes as defined in § 3(k) of the Act.
 - 1.4.5. Flotables, garbage, domestic trash, waste chemicals, solid waste, or any materials prohibited by the Ocean Dumping Ban Act or the Marine Plastic Pollution Research and Control Act.
- 1.5. Nothing contained herein shall be deemed to authorize, in any way, violation of applicable American Samoa Water Quality Standards. The following water quality standards apply:

Table 1. 1989 American Samoa Water Quality Standards: Oceanic Waters [§24.0207(g)(1-7)].

Parameter	Median Not to Exceed the Given Value
Turbidity	0.20 NTU
Total Phosphorus	11.0 μg-P/L
Total Nitrogen	115.0 μg-N/L
Chlorophyll a	0.18 µg/L
Light Penetration Depth	150 feet, to exceed the given value 50% of the time.
Dissolved Oxygen	Not less than 80% of saturation or less than 5.5 mg/L. If the natural level of dissolved oxygen is less than 5.5 mg/L, then the natural dissolved oxygen level shall become the standard.
рН	The pH range shall be 6.5 to 8.6 pH units and within 0.2 pH units of the level which occurs naturally.

- 1.6. After notice and opportunity for a hearing, this permit may be revised, revoked or limited, in whole or in part, subject only to the provisions of 40 C.F.R. §§ 222.3(b) through 222.3(h) and 40 C.F.R. § 223.2, as a result of a determination by the Regional Administrator of EPA that:
 - 1.6.1. The cumulative impact of the permittee's dumping activities or the aggregate impact of all dumping activities in the dump site designated in Special Condition 2.2 should be categorized as Impact Category I, as defined in 40 C.F.R. § 228.10(c)(1);
 - 1.6.2. There has been a change in circumstances about regarding the management of the disposal site designated in Special Condition 2.2;
 - 1.6.3. The dumping authorized by the permit would violate applicable American Samoa Water Quality Standards;
 - 1.6.4. The dumping authorized can no longer be carried out consistent with the criteria defined at 40 C.F.R. Parts 227 and 228;
 - 1.6.5. The permittee violated any term or condition of the permit;
 - 1.6.6. The permittee misrepresented, or did not disclose all relevant facts in the permit application accurately; or
 - 1.6.7. The permittee did not keep records, engage in monitoring and reporting activities, or to notify appropriate officials in a timely manner of the transportation and dumping activities as specified in any condition of this permit.
- 1.7. The permittee shall ensure always that facilities, including any vessels associated with the permit, are in good working order to achieve compliance with the terms and conditions of this permit. During all transportation and loading operations, there shall not be a loss of fish processing wastes to any waterway. During transport to the disposal site, there shall not be a loss of fish processing wastes to Pago Pago Harbor or the ocean.
- 1.8. Any change in the designated fish processing waste transporter may be made at the discretion of the Regional Administrator or his delegate. A written request for such a transfer shall be made by the permittee at least thirty (30) days before the requested transfer date. Written approval by the EPA Regional Administrator must be obtained before such a transfer occurs.
- 1.9. The permittee shall allow the EPA Regional Administrator, the Commander of the Fourteenth U.S. Coast Guard District (USCG), the Director of the American Samoa Environmental Protection Agency (ASEPA), and/or their authorized representatives to:

- 1.9.1. Enter into, upon, or through the permittee's premises, vessels, or other premises or vessels under the control of the permittee, where, or in which, a source of material to be dumped is located or in which any records are required to be kept under the terms and conditions of this permit or the Act;
- 1.9.2. Have access to and copy any records required to be kept under the terms and conditions of this permit or the Act;
- 1.9.3. Inspect any dumping equipment, navigational system equipment, monitoring equipment or monitoring methods required in this permit;
- 1.9.4. Sample or require that a sample be drawn, under EPA, USCG, or ASEPA supervision, of any materials discharged or to be discharged; or
- 1.9.5. Inspect laboratory facilities, data, and quality control records required for compliance with any condition of this permit.
- 1.10. Material which is regulated by this permit may be disposed of, due to an emergency, to safeguard life at sea in locations or in a manner that does not comply with the terms of this permit. If this occurs, the permittee shall make a full report, according to the provisions of 18 U.S.C. § 1001, within 15 days to the EPA Regional Administrator, the USCG and the ASEPA describing the conditions of this emergency and the actions taken, including the location, the nature and the amount of material disposed.
- 1.11. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of rights, nor any infringement of Federal, State or local laws or regulations, nor does it obviate the necessity of obtaining State or local assent required by applicable law for the activity authorized.
- 1.12. This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities, or, except as authorized by this permit, the conduct of any work in any navigable waters.
- 1.13. Unless otherwise provided for herein, all terms used in this permit shall have the meanings assigned to them by the Act or 40 C.F.R. Parts 220 through 228, issued thereunder.

2. SPECIAL CONDITIONS - DISPOSAL SITE AND FISH PROCESSING WASTE CHARACTERIZATION

Special conditions are necessary to define the length of the permit period, identify the disposal site location, describe fish processing waste streams and define maximum permitted limits for each fish processing wasteDAF Sludge, Cooker Juice and Press Liquor.

2.1. Location of the Waste Generator and Duration of the Permit

- 2.1.1. The material to be dumped shall consist of fish processing wastes, defined in Special Conditions 2.3 and 2.4, generated at the permittee's fish cannery in Pago Pago, American Samoa.
- 2.1.2. This permit shall become effective on July 31September 1, 1993 and it shall expire three years from the effective data at midnight on July 31August 31, 1996.

2.2. Location of Disposal Site

Disposal of fish processing wastes generated at the location defined in Special Condition 2.1.1 shall be confined to a circular area with a 1.5 nautical mile radius, centered at 14° 24.00' South latitude by 170° 38.30' West longitude.

2.3. Description of Fish Processing Wastes

2.3.1. During the term of this permit, and according to all other terms and conditions of this permit, the permittee is authorized to transport and dispose a maximum of 200,000 gallons per day of fish processing wastes pumped from a storage tank on the permittee's premises. The fish processing wastes pumped from the permittee's storage tank are authorized for disposal at the designated ocean disposal site. Fish processing wastes pumped into the permittee's onshore storage tanksfor disposal into ocean waters quantities of fish processing wastes that shall not exceed the following amounts:

Table 2. Volumes of Fish Processing Wastes Authorized Generated Each Day by StarKist Samoa and Pumped into a Storage Tank before Loading into the Ocean Disposal Vessel for Disposal.

Fish Processing Waste	Maximum Volume Generated (gallons/day)
Dissolved Air Flotation (DAF) Sludge	30,000
Cooker Juice	70,000
Press Liquor	100,000
Maximum Daily Volume Generated and Pumped into a Storage Tank before Loading into the Disposal Vessel	200,000

2.4. Fish Processing Waste Stream Limits

Table 3.	Limits	for DA	F Sludge,	Cooker	Juice	and	Press	Liquor.
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Physical or Chemical Parameter (units)*	DAF Sludge	Cooker Juice	Press Liquor	
Total Solids (mg/L)	163,430	114,180	327,870	
Total Volatile Solids (mg/L)	136,180	63,400	292,280	
5-Day BOD (mg/L)	232,320	185,150	310,790	
Oil and Grease (mg/L)	64,100	11,810	112,080	
Total Phosphorus (mg/L)	1,640	940	3,160	
Total Nitrogen (mg/L)	7,020	7,560	20,360	
Ammonia (mg/L)	1,830	690	1,390	
pH (pH units)	5.3 to 6.5 7.0	5.9 to 6.3 7.0	5.8 to 6.5 7.0	
Density (g/mL)	0.97 to 1.06	0.98 to 1.06	0.99 to 1.08	

- a = All calculated values were rounded to the nearest 10, except the density and pH ranges.
- 2.4.2. Permitted Maximum Concentrations for each type of fish processing waste stream were calculated based on an analysis of historical data from the permittee's previous Special Ocean Dumping Permit, number OD 90-01. The calculations followed EPA's recommended procedure for determining permit limits as defined in the EPA document titled: "Guidance Document for Ocean Dumping Permit Writers" (January 30, 1988). EPA Region IX will periodically review these limits during the permit to evaluate the accuracy of the limits. If revisions are necessary, EPA Region IX will make changes according to the authority defined in the Ocean Dumping Regulations at 40 C.F.R §§ 223.2 through 223.5.
- 2.4.3. The Permitted Maximum Concentrations, density range and pH range listed above, shall not be exceeded at any time during the term of this permit.

3. SPECIAL CONDITIONS - ANALYSIS OF FISH PROCESSING WASTES

Compliance with the permitted maximum concentrations defined in Special Condition 2.4 shall be determined by monthly monitoring of each of the fish processing waste streams permitted for ocean disposal. Additional analyses of fish processing wastes and reporting requirements are defined in this section. Any fish processing waste stream sampling dates

shall be scheduled within the first two weeks of the month to allow enough time for laboratory analyses and report writing to comply with Special Condition 3.3.

3.1. Analyses of Fish Processing Wastes

3.1.1. Concentrations or values of the parameters listed in Special Condition 2.4 and those listed in the table below shall be determined for each fish processing waste stream. A sample of each fish processing waste stream shall be taken before the individual streams are mixed before beingand pumped into an onshore storage tankthe disposal vessel. A sample shall consist of three replicate samplesgrab samples, taken on the day that sampling is scheduled, pooled for use as a composite sample. The detection limits specified in Table 4 shall be used in all fish processing waste stream analyses.

Table 4. Physical and Chemical Parameters to be Analyzed from Individual Samples of DAF Sludge, Precooker Water and Press Water.

Parameter	Method Detection Limit
Total Solids	10.0 mg/L
Total Volatile Solids	10.0 mg/L
5-Day BOD	10.0 mg/L
Oil and Grease	10.0 mg/L
Total Phosphorus	1.0 mg/L
Total Nitrogen	1.0 mg/L
Ammonia	1.0 mg/L
pН	0.1 pH units
Density	0.01 g/mL

- 3.1.2. In addition to the fish processing waste stream samples taken under Special Condition 3.1.1, the permittee shall analyze samples taken from its onshore fish processing waste storage tank during the transfer of these wastes to the disposal vessel's holding tanks.
 - 3.1.2.1. Three samples shall be taken from the onshore storage tank transfer line at 10 minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee.

- 3.1.2.2. Samples described in Special Condition 3.1.2.1 shall be taken for 12 months. Samples shall be collected on the same day that samples are taken for analysis under Special Condition 3.1.1 and another sample shall be taken one week later.
- 3.1.2.3. The same parameters and detection limits listed in Table 4 shall be analyzed and used for the onshore storage tank composite samples. This sampling and analysis program will provide 2 samples per month for 12 months yielding 24 samples.
- 3.1.2.4. The permittee shall send a copy of the analytical data for the onshore storage tank samples to EPA Region IX every 3 months during the 12-month sampling period. EPA Region IX will use these results to calculate limits for the onshore storage tank fish processing wastes. When the onshore storage tank limits are calculated, EPA Region IX will evaluate whether to amend this permit using the new limits.
- 3.1.3. All sampling procedures, analytical protocols, and quality control/quality assurance procedures shall be performed according to guidelines specified by EPA Region IX. The following references shall be used by the permittee:
 - 3.1.3.1. 40 C.F.R. Part 136, EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act:
 - 3.1.3.2. Tetra Tech, Incorporated. 1985. Summary of U.S. EPA-approved Methods, Standard Methods and Other Guidance for 301(h) Monitoring Variables. Final program document prepared for the Marine Operations Division, Office of Marine and Estuarine Protection, U.S. Environmental Protection Agency. EPA Contract No. 68-01-693. Tetra Tech, Incorporated, Bellevue, Wa.; and
 - 3.1.3.3. Environmental Protection Agency. 1987. Quality Assurance and Quality Control for 301(h) Monitoring Programs: Guidance on Field and Laboratory Methods. Office of Marine and Estuarine Protection, Washington, D.C. EPA 430/9-86-004.
- 3.1.3. Any parameters listed in Special Condition 3.1.1 that are shown to be consistently undetected, may be eliminated from further analytical tests. Before elimination of the parameter is permitted, the permittee shall obtain written approval from EPA Region IX and the ASEPA.

3.2. Analytical Laboratory

- 3.2.1. Within 30 days of the effective date of this permit, the name and address of the contract laboratory or laboratories and a description of all analytical test procedures and quality assurance/quality control procedures, including detection limits being used, shall be provided for EPA Region IX approval.
- 3.2.2. Any potential variation or change in the designated laboratory or analytical procedures shall be reported, in writing, for EPA Region IX approval.
- 3.2.3. EPA Region IX may require analyses of quality control samples by any laboratories employed to comply with Special Condition 3.1 and Appendix A. Upon request, the permittee shall provide EPA Region IX with the analytical results from such samples.
- 3.2.4. A complete analysis of parameters, required in Special Condition 3.1, shall be made by the permittee and reported to EPA Region IX and the ASEPA whenever there is a significant change in the quality of thea fish processing waste stream as determined by EPA Region IX or the ASEPA, process configuration, or fish processing waste treatment. If required by processary, EPA Region IX, bioassays shallmay be required in addition to parameter analyses.

3.3. Reporting

- 3.3.1. The permittee shall provide EPA Region IX, ASEPA, the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS) and the Western Pacific Regional Fishery Management Council (WPRFMC) with a report, prepared every 63 months during the permit period, that contains the following information:
 - 3.3.1.1. Daily volumes of DAF Sludge, Cooker Juice and Press Liquor removed fromgenerated at the permittee's facility, and pumped into the permittee's onshore storage tanksloaded into the disposal vessel. These volumes shall be reported in gallons per day using Form 1 (see Appendix B);
 - 3.3.1.2. Daily volumes of fish processing wastes disposed at the ocean disposal site. These volumes shall be reported in gallons per day using Form 1 (see Appendix B);
 - 3.3.1.3. Monthly fish processing waste stream analyses demonstrating that the fish processing wastes being dumped comply with the permitted limits of parameters listed in Special Condition 2.4 and a summary of the volumes of fish processing wastes disposed at the ocean site using Form 2 (see Appendix B);

- 3.3.1.4. The monthly amount of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams reported in pounds per month (see Forms 1 and 2).
- 3.3.2. Such reports, including a comparison with the permit limits as required on Forms 1 and 2, shall be submitted to EPA Region IX, ASEPA, NMFS USFWS and WPRFMC within 45 days of the end of the preceding 63-month period for which they were prepared. The reports shall be submitted within this time unless extenuating circumstances are communicated to EPA Region IX and the ASEPA in writing. In addition to a hard copy of Forms 1 and 2, the data contained on Form 1 shall be submitted to EPA Region IX on a 3.5" computer diskette in a format compatible with LOTUS version 2.2.
- 3.3.3. A summary report of all 63-month reports listed in Special Condition 3.3.1, including a comparisons with permit limits and a detailed discussion of the summary results, shall be submitted by the permittee to EPA and the ASEPA 45 days after the permit expires. All fish processing waste stream data shall be reported in the same format as required in Special Condition 3.3.2.
- 3.3.4. Upon detection of a violation of any permit condition, the permittee shall send a written notification of this violation to EPA Region IX and the ASEPA within five working days and a detailed written report of the violation shall be sent to the agencies within 15 working days. This notification shall pertain to any permit limits (defined in Special Condition 2.4) that are exceeded, violation of volume limits (defined in Table 2 under Special Condition 2.3.1), and any disposal operation that occurs outside the disposal site defined in Special Condition 2.2.
- 3.3.5. Eighteen months One-year from the effective date of this special permit, the permittee shall submit a report to EPA and ASEPA on the results of suspended phase bioassay tests and reevaluation of the model used to predict the concentrations of fish processing wastes disposed at the designated site. The suspended phase bioassays shall be conducted using at least one species from each of the following three groups: Group 1 = Mytilus sp. (mussel), Crassostrea sp. (oyster), Acartia tonsa (copepod), or Trypneustes sp. (sea urchin) larvae; Group 2 = Holmesimysis costata (mysid shrimp) or Penaeus vannamei (white shrimp); and Group 3 = Citharicthys stigmaeus (speckled sanddab) or Coryphaena hippurus (dolphinfish) juveniles.

Appropriate suspended phase bioassay protocols, either protocols approved by EPA or protocols published by the American Society for Testing and Materials (ASTM), shall be followed. Suspended particulate phase bioassays shall be run using the following fish processing waste concentrations: 100%, 75%, 50%, 25%, 12.5%10%, 5%, and a control (0%). A minimum of five replicates are required per dilution concentration. Concurrent reference toxicant tests shall be conducted when the suspended phase bioassays are run.

A sampling and testing plan shall be submitted to EPA Region IX and ASEPA by October 1, 1993 for approval before the bioassay tests are conducted. Samples for the suspended particulate phase bioassays shall be composited from the permittee's onshore storage tanks. Three samples shall be taken from the onshore storage tank transfer line at 10 minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee. The permittee shall take samples on the following dates: November 30, 1993, February 28, 1994 and May 31, 1994. Samples shall be collected and shipped to the testing laboratory according to EPA-approved methods to ensure that the samples do not change before the bioassay tests begin. All suspended particulate phase bioassays shall be started within 10 days of sampling.

The testing plan submitted by October 1, 1993 should also include a proposal to reevaluate the disposal site model using results obtained from the new series of suspended phase bioassays. These bioassays are being required to confirm the toxicity of the fish processing wastes and to reevaluate the disposal operations based on the use of a different disposal vessels.

The bioassay and computer model confirmation report shall contain the following information:

3.3.5.1. INTRODUCTION AND PROJECT DESCRIPTION

The project description should include the following information about fish processing waste toxicity, previous bioassay test results, previous modelling at the ocean disposal site, and the design of the new bioassay tests.

3.3.5.2. MATERIALS AND METHODS

Fish processing waste sampling and sample handling procedures should be described or referenced.

References for laboratory protocols for suspended phase bioassay tests.

- 1) EPA-approved methods and references.
- 2) Test species used in each test, the supplier or collection site for each test species, and QA/QC procedures for maintaining the test species.
- 3) Source of seawater used in reference, control and bioassay tests.
- 4) Data and statistical analysis procedures.
- 5) Limiting Permissible Concentration (LPC) calculations.

6) Description of model selected to evaluate dispersal of fish processing wastes at the ocean disposal site. Use of this model shall be approved by EPA Region IX and ASEPA before it is used by the permittee to evaluate the fish processing waste disposal plume.

3.3.5.3. DESCRIPTION OF SAMPLING PROCEDURES

QA/QC procedures and actual sampling procedures used during fish processing waste stream sampling and handling of the samples.

3.3.5.4. FINAL RESULTS, ANALYSIS OF DATA AND DISCUSSION

- 1) Complete bioassay data tables and summary bioassay tables shall be furnished in the report. All data tables should be typed or produced as a computer printout.
- 2) The permittee shall analyze the bioassay data and calculate the LPC of the material as defined at 40 C.F.R. § 227.27(a-b).
- 3) The permittee shall use the LPC in the approved plume model to determine the concentration of fish processing wastes disposed at the designated ocean disposal site which complies with EPA's Ocean Dumping Criteria defined at 40 C.F.R. Parts 227 and 228.

3.3.5.5. REFERENCES

This list should include all references used in the field sampling program, laboratory protocols, LPC calculations, modelling analyses, and historical data used to evaluate the fish processing waste disposal operations at the designated ocean disposal site.

3.3.5.6. DETAILED QA/QC PLANS AND INFORMATION

The following topics should be addressed in the QA Plan:

- 1) QA objectives.
- 2) Organization, responsibilities and personnel qualifications, internal quality control checks.
- 3) Sampling and analytical procedures.
- 4) Equipment calibration and maintenance.
- 5) Sample custody and tracking.
- 6) documentation, data reduction, and reporting.

- 7) Data validation.
- 8) Performance and systems audits.
- 9) Corrective action.
- 10) Reports.

4. SPECIAL CONDITIONS - VESSEL OPERATIONS

Specifications for vessel operations are defined to limit dumping activities to the dump site identified in Special Condition 2.2 and to record all dumping activities. The permittee's fish processing wastes from the permittee's waste streams and fish processing wastes of other authorized permittees may be loaded into the disposal vessel together or separately. If the waste transported to the disposal site is a combination of materials from the two plants, each permittee shall be liable for all permit conditions regarding disposal of the fish processing wastes. If the fish processing wastes disposed at the site are only generated at the StarKist Samoa plant, then StarKist Samoa shall be solely liable for all permit conditions pertaining to the disposal operation.

4.1. Posting of the Permit

This permit, or a true copy thereof, shall be placed in a conspicuous place on any vessel which is used for the transportation and dumping authorized by this permit.—If the dumping vessel is an unmanned barge, the permit or true copy of the permit shall be transferred to the towing vessel.

4.2. Vessel Identification

Every vessel engaged in the transportation of fish processing wastes for ocean disposal shall have its name and number painted in letters and numbers at least fourteen (14) inches high on both sides of the vessel. The name and number shall be kept distinctly legible always, and a vessel without such markings shall not be used to transport or dump fish processing wastes material.

4.3. Determination of the Disposal Location Within the Dump Site

On each disposal trip, the master of the disposal vessel shall determine the location of the disposal operation as follows:

- 4.3.1. The disposal vessel, as defined under WASTE TRANSPORTER on page 1 of this permit, shall proceed directly to the center of the disposal site at the location specified in Special Condition 2.2.
- 4.3.2. The master of the vessel shall observe the conditions at the dump site center, noting the vessel's position (latitude and longitude), wind direction and observed surface current direction.

- 4.3.3. After the conditions defined in Special Condition 4.3.2 have been recorded, the master of the disposal vessel shall proceed 1.1 nautical miles up current from the center of the disposal site and record the position of the disposal vessel (latitude and longitude). This position shall be the starting point for disposal operations for each disposal trip.
- 4.3.4. The master of the disposal vessel shall prepare a hard copy (on 8.5 inch by 11 inch paper) of the computerized navigational plot documenting compliance withef the procedures defined in Special Conditions 4.3.1 tethrough 4.3.4. The hard copy of the computerized navigational plot for each disposal trip shall be supplied to the permittee and supply these to the permittee. The permittee shall submit these hard copies of the computerized navigational plots with the 63-month reports required under Special Condition 3.3.1. The hard copies of the navigational plots shall include:
 - 4.3.4.1. The disposal vessel's course during the entire dumping operation; and
 - 4.3.4.2. The times and location of entry and exit from the disposal site, position and time of arrival at the center of the disposal site, position and time of arrival at the location 1.1 nautical miles up current from the disposal site, beginning and ending of dumping operations, and disposal vessel position plotted every 15 minutes while dumping operations occur.
- 4.3.5. The master of the disposal vessel shall sign and date each hard copy of the computerized navigational plots certifying that the hard copies are an accurate record of the disposal vessel's track for each disposal trip.
- 4.3.6. The master of the disposal vessel shall certify that disposal operations occurred in the manner required by the permit.
- 4.3.7. The procedures listed in Special Conditions 4.3.1 through 4.3.6 shall be repeated for each disposal trip.

4.4. Disposal Rate and Vessel Speed

- 4.4.1. The disposal vessel/barge shall discharge the material authorized by this permit beginning at the disposal location as determined by Special Condition 4.3.3. The vessel track shall be in a direction that is perpendicular to the current detected at the center of the disposal site as defined in Special Condition 2.2. Disposal shall occur in a oval shape along an axis at least 0.5 nautical miles on either side of the starting point determined in Special Condition 4.3.3. The entire disposal vessel track shall be within the disposal site boundaries.
 - 4.4.1.1. From June 1 through November 30, fish processing wastes shall be pumped from the disposal vessel into the oceanthe disposal

operation at the location plotted in Special Condition 4.3.3. shall be conducted at a rate of 140 gallons per minute per knot, not to exceed 1,400 gallons per minute at a maximum speed of 10 knots.

4.4.1.2. From December 1 through May 31, fish processing wastes shall be pumped from the disposal vessel into the oceanthe disposal operation at the location plotted in Special Condition 4.3.3. shall be conducted at a rate of 120 gallons per minute per knot, not to exceed 1,200 gallons per minute at a maximum speed of 10 knots.

4.5. Computerized Navigational System

The permittee shall use an onboard computerized electronic positioning system to fix the position of the disposal vessel accurately during all dumping operations. The computerized navigational system and the method to produce a 8.5 inch by 11 inch hard copy of each disposal trip must be approved by EPA Region IX and the USCG Liaison Office (CGLO) Pago Pago. The permittee shall submit the description, specifications and example hard copy plots for the computerized navigational system at least 15 working days before the effective date of the permit. Disposal operations shall not begin until EPA Region IX and CGLO Pago Pago provide the permittee with written approval for the computerized navigation system and the hard copy plots.

4.6. Permitted Times for Disposal Operations

Dumping operations shall be restricted to daylight hours, unless an emergency exists as defined at 40 C.F.R. § 220.1(c)(4). ASEPA and CGLO Pago Pago shall be notified immediately if an emergency exists and ocean disposal is required to protect human life at sea. No later than 5 working days after the emergency, the permittee and the waste transporter shall provide EPA Region IX, ASEPA and CGLO Pago Pago with a detailed written report on the emergency situation.

4.7. Reporting of the Ocean Dumping Vessel Operations

- 4.7.1. The waste transporter shall maintain and the permittee shall submit copies of a daily transportation and dumping log, including hard copy plots of all information requested required in Special Conditions 4.3 and 4.7.2. Copies of the daily logs shall be sent to EPA Region IX, CGLO Pago Pago, and the ASEPA as part of the 63-month report.
- 4.7.2. The logbook shall contain the following information for each waste-disposal trip:
 - 4.7.2.1. Permit number, date and consecutive trip number;

- 4.7.2.2. Record of contact with ASEPA and CGLO before each trip to the ocean disposal site.
- 4.7.2.3. The time when loading of the vessel commences and ceases in Pago Pago Harbor;
- 4.7.2.4. The volume of each fish processing waste loaded into the disposal vessel from each fish cannery;
- 4.7.2.5. The time and navigational position that dumping commences and ceases;
- 4.7.2.6. A record of vessel speed and direction every 15 minutes during each dumping operation at the disposal site, and a computerized plothard copy of the vessel's course defined in Special Condition 4.3;
- 4.7.2.7. Discharge rate from the disposal vessel.
- 4.7.2.8. Observe, note and plot the time and position of any floatable material:
- 4.7.2.9. Observe, note and plot the wind speed and direction every 30 minutes while dumping fish processing wastes at the designated disposal site;
- 4.7.2.10. Observe and note current direction at the beginning and end of the disposal trip, and the direction of the wastedisposal plume at the end of the disposal operation;
- 4.7.2.11. Observe, note and plot the presence of the previous disposal plume and any unusual occurrences during the disposal trip, or any other information relevant to the assessment of environmental impacts as a result of dumping activities; and
- 4.7.2.12. Any unusual occurrences noted under Special Condition 4.7.2.9 shall be highlighted in the report defined in Special Condition 3.3.1.

5. SPECIAL CONDITIONS - DUMP SITE MONITORING

The monitoring program for disposal of fish processing wastes in the ocean must document effects of disposed wastes on the receiving waters, biota, and beneficial uses of the receiving waters; compliance with EPA's Ocean Dumping Regulations; and determine compliance with permit terms and conditions. Revisions to the monitoring program may be made under the direction of EPA Region IX at any time during the permit term, in compliance with 40 C.F.R. §§ 223.2 and 223.3. This may include a change in the number of

parameters to be monitored, the frequency of monitoring, the location of sample stations, or the number and size of samples to be collected.

Implementation of the disposal site monitoring program and all segments of the monitoring program specified in Special Condition 5 and Appendix A shall be the responsibility of the permittee.

5.1. Monitoring Program

The permittee shall conduct the monitoring program, defined in Appendix A, to determine the environmental impacts of ocean dumping of fish processing waste. If possible, monitoring cruises shall be scheduled within the first two weeks of each month to allow enough time for laboratory analysis and report writing in compliance with Special Condition 5.2. The permittee shall notify the ASEPA at least 48 hours before any scheduled monitoring activities.

5.2. Monitoring Reports

Monthly site monitoring reports shall be submitted to EPA Region IX, the ASEPA, NMFS, USFWS and WPRFMC with the 63-month reports as specified in Special Condition 3.3.2. The reports shall include: neatly compiled raw data for all sample analyses, quality assurance/quality control data, statistical analysis of sample variability between stations and within samples for each parameter, and a detailed discussion of the results.

5.3. Final Summary Report

- 5.3.1. A report shall be submitted to EPA Region IX, ASEPA, NMFS, USFWS and WPRFMC 60 days after the permit expires. This report shall summarize all of the data collected during the waste material to characterize fish processing wastes and the results of the dump site monitoring programs specified in this special permit.
- 5.3.2. At a minimum, the summary report shall contain the following sections:
 - 5.3.2.1. Introduction (including a summary of previous ocean disposal activities),
 - 5.3.2.2. Location of Sampling Sites,
 - 5.3.2.3. Materials and Methods,
 - 5.3.2.4. Results and Discussion (including comparisons and contrasts with previous MPRSA § 102 research and special permit data related to disposal of fish processing wastes off American Samoa),

- 5.3.2.5. Conclusions; and
- 5.3.2.6. References.

5.4. Quality Assurance/Quality Control

- 5.4.1. All appropriate phases of the monitoring, sampling, and laboratory analytical procedures shall comply with the EPA Region IX-specified protocols and references listed in Special Condition 3.1.2.
- 5.4.2. The qualifications of the on-site Principal Investigator in charge of the field monitoring operation at the dump site shall be submitted to EPA Region IX and the ASEPA for approval before the initial monitoring cruise. Notification of any change in this individual shall be submitted to EPA Region IX and ASEPA at least 7 days before the cruise is scheduled.

6. SPECIAL CONDITIONS - NOTICE TO REGULATORY AGENCIES

- 6.1. Notice of Sailing to the U.S. Coast Guard Liaison Office and the American Samoa Environmental Protection Agency
 - 6.1.1. The waste transporter shall provide telephone notification of sailing to CGLO Pago Pago at 633-2299 and the ASEPA at 633-2304 during working hours (7:00 a.m. to 3:30 p.m.) no later than 24 hours before the estimated time of departure for the dump site defined in Special Condition 2.2. A record of contact with both agencies shall be reported with other information for each disposal trip.
 - 6.1.2. The waste transporter shall immediately notify CGLO Pago Pago and the ASEPA upon any changes in the estimated time of departure greater than two hours.
 - 6.1.3. Surveillance of activities at the dump site designated in Special Condition 2.2, may be accomplished by unannounced aerial overflights, a USCG shiprider and/or a ASEPA shiprider who will be on board the towing/conveyance vessel for the entire voyage. Within two hours after receipt of the initial notification the waste transporter will be advised whether or not a shiprider will be assigned to the waste transporter's disposal vessel.
 - 6.1.4. The following information shall be provided to CGLO Pago Pago and the ASEPA in the notification of sailing defined above:
 - 6.1.4.1. The time of departure,
 - 6.1.4.2. Estimated time of arrival at the dump site,
 - 6.1.4.3. Estimated time of departure from the dump site, and

6.1.4.4. Estimated time of return to port.

6.2. Reports and Correspondence

6.2.1. Two copies of all reports and related correspondence required by General Condition 1.10, Special Conditions 3.2, 3.3, 4.3, 4.5, 4.6, 4.7, 5.2, 5.3, 5.4, 6.1, and all other materials, including applications shall be submitted to EPA Region IX at the following address:

Office of Pacific Island and Native American Programs (E-4) U.S. Environmental Protection Agency, Region IX 75 Hawthorne Street San Francisco, California 94105-3901 Telephone (415) 744-1594

6.2.2. Two copies of all reports required by General Condition 1.10 and Special Conditions 4.5, 4.6, 4.7 and 6.1 sent to the U.S. Coast Guard shall be submitted to the following address:

Commanding Officer
U.S. Coast Guard Liaison Office
P.O. Box 249
Pago Pago, American Samoa 96799
Telephone (684) 633-2299

6.2.3. Three copies of all reports required by General Condition 1.10 and Special Conditions 3.2, 3.3, 4.3, 4.5, 4.6, 4.7, 5.2, 5.3, 5.4 and 6.1 sent to the American Samoa Environmental Protection Agency shall be submitted to the following address:

Director

American Samoa Environmental Protection Agency Office of the Governor Pago Pago, American Samoa 96799 Telephone (684) 633-2304

6.2.4. One copy of the all reports required by Special Conditions 3.3, 5.2 and 5.3 shall be sent to the USFWS, the NMFS and the WPRFMC at the following addresses:

Project Leader
Office of Environmental Services
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard
P.O. Box 50167
Honolulu, Hawaii 96850

Western Pacific Program Officer National Marine Fisheries Service 2570 Dole Street Honolulu, Hawaii 96822-2396

Executive Director
Western Pacific Regional Fishery Management Council
1164 Bishop Street, Suite 1405
Honolulu, Hawaii 96813

Signed this	day of	, 1993
For the Regional A	Administrator	
{To be signed whe	n the Final I	Permit is prepared]
Harry Seraydarian, Water Managemen		
U.S. EPA, Region	IX	

APPENDIX A

SPECIAL OCEAN DUMPING PERMIT OD 93-01 OCEAN DUMP SITE MONITORING PLAN

7. MONITORING OF RECEIVING WATER

Monitoring of the receiving waters at the disposal site defined in Special Condition 2.2 shall be the responsibility of the permittee. Funding and cooperation for site monitoring may be accomplished through an agreement between permittee and other permittees authorized to use the disposal site. Any agreements negotiated between the permittee and other authorized permittees shall be the sole responsibility of the permittee named in this permit. EPA Region IX requires that a monitoring program be developed that complies with the special conditions defined below.

During each monitoring cruise, the fish processing wastedisposal plume from the disposal vessel shall be sampled by taking discrete water samples for the measurement of parameters listed in Special Condition 7.2.4. Results of the first 63-month monitoring report will be evaluated by EPA Region IX to determine whether portions of Special Conditions 7 and/or 8 will be revised. The evaluation will be based on documented sampling results and recommendations by the permittee(s).

7.1. Location of Water Sampling Stations

- 7.1.1. On each sampling cruise, the latitude and longitude of all sampling stations shall be determined and plotted using an acceptable navigational system.
- 7.1.2. The Principal Investigator shall ensure that discrete water samples are taken at the locations marked in Figure 1.

				Prevailing Surface Current Direction
5 Leading Edge of Plume	4 1.0 nmi	3 0.5 nmi	2 0.25 nmi	1 Starting

Figure 1. Orientation of Sample Stations (Top View) in the Middle of the Discharge Plume Visually Identified at the Time of Sampling.

- 7.1.3. The following stations, defined in Figure 1, shall be sampled on each sampling cruise:
 - 7.1.4.1. Station 1 shall be the starting point of the dumping operation as determined in Special Condition 4.3.

- 7.1.4.2. Station 2 shall be 0.25 nautical miles (nmi) down-current from Station 1.
- 7.1.4.3. Station 3 shall be 0.5 nmi down-current from Station 1.
- 7.1.4.4. Station 4 shall be 1.0 nmi down-current from Station 1.
- 7.1.4.5. Station 5 shall be at the leading edge of the discharge plume, but within the plume.
- 7.1.4. The Principal Investigator shall ensure that each sampling station is positioned as close as possible to the middle of the discharge plume according to his/her best professional judgment.

7.2. Water Column Characteristics to Be Measured

- 7.2.1. Discrete water samples at Stations 1, 2, 3, 4, and 5 shall be taken at depths of 1, 3, and 10 meters from the surface at the middle of the plume visually identified by the Principal Investigator.
- 7.2.2. Surface water conditions shall be recorded at all stations including:
 - 7.2.2.1. Wind speed and direction;
 - 7.2.2.2. Current direction and wave height; and
 - 7.2.2.3. Observations of waste, plume color (e.g., Forel-Ule color scale), odor, floating materials, grease, oil, scum, and foam.
- 7.2.3. Water samples shall be obtained using a self-closing 3-liter water sample device at each depth listed in 7.2.1.
- 7.2.4. Water column parameters analyzed from discrete samples taken at the depths listed in 7.2.1 shall include:

Table 4. Physical and Chemical Parameters to be Analyzed from Water Samples Taken at the Ocean Disposal Site.

Parameter ^a	Method Detection Limit
Total Suspended Solids	10.0 mg/L
Total Volatile Suspended Solids	10.0 mg/L
Oil and Grease	10.0 mg/L

Parameter*	Method Detection Limit
Total Phosphorus	1.0 mg/L
Total Nitrogen	1.0 mg/L
Ammonia	1.0 mg/L
pН	0.1 pH units

a = Samples should be acidified to pH <2 with sulfuric acid and refrigerated a 4°C until analysis.

7.2.5. Temperature measurements shall be taken at depths of 1, 3, and 10 meters at the starting point of the disposal operation, as defined in Special Condition 4.3.3.

7.3. Frequency of Sampling

- 7.3.1. Water samples shall be collected when dumping operations occur. Each station listed under Special Condition 7.1 shall be sampled once each month. These samples shall be used to characterize the receiving waters at the disposal site.
- 7.3.2. Control samples shall be taken at Station 1 before dumping activities.
- 7.3.3. Station 1 shall be sampled at a point within the plume immediately after discharge operations cease.
- 7.3.4. Stations 2 through 5 shall be sampled consecutively at distances indicated in Special Condition 7.1.4 to allow efficient sampling of the discharge plume. The time between each sample and the sampling location, beginning with the control sample and ending with the sample collected at the leading edge of the plume, shall be recorded.

7.4. Water Quality Criteria and Standards

7.4.1. The LPC of the liquid phase of the fish processing wastes material shall not be exceeded at the disposal site boundary four hours after disposal operations cease. The LPC, as defined at 40 C.F.R. §227.27, is that concentration of the material which, after allowance for initial mixing as defined at 40 C.F.R. §227.29, does shall not exceed applicable American Samoa Oceanic Water Quality Standards (see Table 1). EPA Region IX and the ASEPA will evaluate the LPC based on EPA's Ocean Dumping Regulations and the concentration of parameters measured at the stations sampled during the tenure of this permit.

8. MONITORING OF BIOLOGICAL COMMUNITIES

8.1. Pelagic Resources

- 8.1.1. All sightings of fish, sea turtles, sea birds, or cetaceans near the disposal site shall be recorded including:
 - 8.1.1.1. Time, location and bearing;
 - 8.1.1.2. Species name(s); and
 - 8.1.1.3. Approximate number of individuals.

APPENDIX B - REPORT FORM 1

Monthly Volumes or StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month		19

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
			1			

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
			·			
Monthly Totals						

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly o	quantities of alum (alumir	num sulfate) and	coagulant polymer	added to the	fish processing	waste st	reams
	Aluminum sulfate:		pounds/month				
	Coagulant polymer:	TOWN A	pounds/month				

APPENDIX B - REPORT FORM 2

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA § 102 Permit #OD 93-01

Reporting Period: From	19	To	19
1		-	

StarKist Samoa - Dissolved Air Flotation (DAF) Sludge

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oll and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
OD 93-01 Permit Limits	163,430	136,180	232,320	64,100	1,640	7,020	1,830	5.3 to 7.0	0.97 to 1.06

StarKist Samoa - Cooker Juice

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitro gen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
		<u> </u>		<u> </u>					
OD 93-01 Permit Limits	114,180	63,400	185,150	11,810	940	7,560	690	5.9 to 7.0	0.98 to 1.06

StarKist Samoa - Press Liquor

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
OD 93-01 Permit Limits	327,870	292,280	310,790	112,080	3,160	20,360	1,390	5.8 to 7.0	0.99 to 1.08

NOTE: An asterisk (*) next to the waste concentration signifies that a violation of the permit limit has occurred.

Cumulative Yearly Data on Fish Processing Wastes Generated at StarKist Samoa's Plant and Disposed at the Ocean Site. MPRSA §102 Special Permit #OD 93-01

Reporting Period: From	19	To	19)

Month & Year	DAF Sludge Generated (gallons/month)	Cooker Water Generated (gallons/month)	Press Liquor Generated (gallons/month)	Total Generated (gallons/month)	Aluminum sulfate (pounds/month)	Coagulant polymer (pounds/month)	Volume Ocean Disposed (gallons/month)
				-			

Cumulative Yearly Totals							

NOTE: A separate table shall be prepared for each calendar year.

Red. EAS 5/6/8/mike

P.O. Box 1 35

Telephone

Facsimile:

A Division of Star-Kist Foods, Inc.

i84 644-4231 i84 644-2440

Pago Page, " utuila Island American & 10a 96799

StarKist Samoa, Inc.



Carl Goldstein
American Samoa Program Manager
U.S.E.P.A. Region 1X
75 Hawthorne St.
San Francisco, CA 94105

April 09, 1998

In compliance to the requirement of Section 3.3.3. of Ocean Dumping permit OD 9 - 11

Section 3.3.3

A summary report of all 3-month reports listed in Special Condition 3.3.1, i.e uding a comparisons with permit limits and a detailed discussion of the summary re. u ts, shall be submitted by the permittee to EPA and the ASEPA 45 days after the permit expires. All fish processing waste stream data shall be reported in the same format as required in Special Condition 3.3.2

Enclosed is a copy of the "Final Summary Report" summarizing the data collected in ring the Administrative Extension for Ocean Dumping Permit OD 93-01. Such period covers the months beginning from August 1996 till February 1998 of the waste and dump site in initoring program for the OD 93-01

The sampling sites are located on land at the Starkist Cannery in American Samoa.

A sample of each waste stream was sampled before they mix consisting of three (3) replicate samples, taken on the scheduled day, pooled for use as a composite sample. This was he case until October 1995 at which time we received an amended section to our report requesting one sample of the streams after they combined.

This report differs from the OD 90-01 report in that the three (3) streams were comb ned into one sample station in October 95.

Sincerely

Virgil W. Shouse Jr.

Manager. Cannery Manufacturing

cc: Mr. Topgipa Tausaga; A.S.E.P.A. Director

Mr. Norman Lovelace; OPINAP Project Leader of U.S.F.W.S. Executive Director of WPRFMC

Table1. Star Kist Samoa On Shore Storage Tank Data September 1996 to February 1998 under OD 93-01

	·	5-Day Biological	Total	Total	Oil &				
	Total Solids	Oxygen Demand	Phosphorus	Nitrogen	Grease	рН	Total Volatile	Density	Ammonia
Month	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(pH units)	Solids (mg/L)	(g/mL)	(mg/L)
9/15/96	79,600	57,818	981	8,290	23,354	6.80	63,400	1.00	4,550
9/19/96	92,600	55,617	902	6,850	27,124	6.60	70,500	1.02	4,970
10/9/96	54,000	63,379	771	6,890	26,426	6.80	38,600	1.01	3,980
10/29/96	48,200	58,238	694	6,100	11,480	6.70	34,100	1.01	3,180
11/15/96	34,900	43,133	632	5,850	6,845	6.51	20,000	1.03	3,490
12/19/96	55,500	63,530	871	6,520	9,526	6.28	40,500	1.00	3,310
1/10/97	43,500	57,267	637	4,670	13,009	6.20	29,200	1.00	3,280
1/17/97	47,000	72,365	709	4,700	19,901	6.33	35,000	1.00	2,720
2/13/97	219,000	66,320	2,070	11,000	32,944	6.21	190,000	1.00	2,160
2/25/97	38,000	69,732	785	4,090	4,248	6.63	26,100	1.00	2,570
3/20/97	22,200	58,182	771	5,070	7,225	6.80	9,480	1.01	3,230
3/27/97	30,000	70,503	863	5,910	8,240	6.26	15,500	1.00	3,850
4/3/97	24,000	61,329	809	5,250	9,999	7.00	9,690	1.00	3,490
4/11/97	55,400	55,434	1,090	4,170	16,874	6.49	42,700	1.02	1,890
5/15/97	45,900	55,221	655	5,650	16,054	6.60	29,600	1.00	3,520
6/5/97	44,200	41,272	645	5,390	13,954	6.60	25,900	1.00	3,460
6/14/97	40,300	60,051	671	6,740	8,964	6.80	23,800	1.02	4,180
7/10/97	32,100	43,169	577	5,870	7,345	6.70	15,200	1.01	3,870
7/17/97	34,700	39,292	542	6,460	8,834	6.80	20,900	1.02	4,280
8/7/97	63,400	49,674	442	5,830	21,958	6.70	43,300	1.02	4,290
8/14/97	64,300	35,984	568	5,180	10,034	6.66	42,500	1.05	3,640
9/11/97	31,800	48,098	626	5,190	16,235	6.66	16,100	1.00	3,770
9/18/97	23,500	46,452	561	4,720	13,923	6.70	10,800	0.99	3,570
10/23/97	33,000	38,246	566	6,320	12,269	6.90	17,100	1.02	4,030
10/31/97	30,000	30,041	353	3,350	4,356	6.80	11,100	1.01	1,980
11/20/97	29,800	38,293	460	4,810	15,169	6.90	17,400	1.00	3,340
11/28/97	53,900	49,559	506	5,030	15,608	6.70	37,100	1.01	3,450
12/11/97	63,800	40,409	804	6,590	15,622	6.78	49,500	1.01	1,090
12/20/97	25,200	67,615	396	4,150	16,986	6.62	13,300	1.02	2,890
1/7/98	38,900	43,263	483	5,510	13,066	7.20	24,100	1.00	3,410
1/15/98	29,800	40,217	607	6,170	9,155	6.90	16,200	1.02	4,000
2/4/98	43,500	65,840	624	5,270	19,216	6.90	28,200	1.01	3,310
2/12/98	43,700	68,149	759	6,380	20,830	6.94	28,200	1.01	4,270

Table1. Star Kist Samoa On Shore Storage Tank Data September 1996 to February 1998 under OD 93-01

Month	Total Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Oil & Grease (mg/L)	pH (pH units)	Total Volatile Solids (mg/L)	Density (g/mL)	Ammonia (mg/L)
Maximum	219000	72365	2070		1	1	190000	1	
Minimum Number	22200 33	30041 33	353 33	3350 33	33	33	33	1 33	1090 33
Mean Std. Dev.	48961 34030	53142 11643	710 291	5757 1354	14448 6680	0	33184 31355	1 0	3425 801
Outlier+ Outlier-	151049 -53128	88072 18212	1583 -163	9817 1696	34488 -5592	7 6	127250 -60882	1	5828 1022
Upper Lim Lower Lin Rounded L	nit								
		Data With Outliers	Removed a	nd Recomr	nended Pe	rmit Limits			
Number Mean	33 48961	33 53142	33 710	33 6515	26023	7	33 38367	33 1	33 3808
Std. Dev. Upper Lim		11643	291	2018	11729	0	15194	0	1108
Lower Lim Rounded L									
		ecial Permit #OD 9				N.L.	NI -		A.I.
Upper Lim Lower Lim	it			None	None	None	None	None	None
		Limits from OD 90							
Upper Lim Percent Ch		None	None	None	None	None	None	None	None
Lower Lim Percent Ch	it								

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CALCULATIONS FO	OR NEW PERMIT L	IMITS				
Column A	Column B	Column C	Column D	Column E	Column F	F
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		chi
Sample Number	Total Solids	Total Solids	Minus Untransformed	Minus Transforme	Column D	
	(mg/L)	(mg/L)	Total Solids Value	Total Solids Value		v g
	58,300	10.97335737	-2343.606557	-0.094996169	5492491.696	
	35,800	10.48570317	20156.39344	0.392658031	406280196.6	181
	35,400	10.4744671	20556.39344	0.403894104	422565311.4	1000
4	70,140	11.15824852	-14183.60656	-0.279887321	201174695	
	4 · · · · · · · · · · · · · · · · ·	11.59910316	-53043.60656	-0.720741958	2813624197	
6	50,600	10.83170686	5356.393443	0.046654348	28690950.71	
	50,200	10.82377031	5756.393443	0.054590897	33136065.47	
8	∳	11.15482093	-13943.60656	-0.276459725	194424163.8	-
9	46,300		9656.393443	0.135463963	93245934.32	-
10	51,300	10.84544603	4656.393443 13856.39344	0.032915172 0.230558183	21681999.89 191999639.2	-'
11	42,100 73,600	10.64780302 11.2064003	-17643.60656	-0.328039102	311296852.4	
13		10.32875529	25356.39344	0.549605915	642946688.4	ì
14		10.57387775	16856.39344	0.304483457	284137999.9	C
15	46,600	10.74935582	9356.393443	0.129005383	87542098.25	C
16	36,700	10.51053203	19256.39344	0.367829169	370808688.4	
17	48,600		7356.393443	0.086982393	54116524.48	0.00130394
18	55,100	10.916905	856.3934426	-0.038543792	733409.7286	0.00148562
19	37,100	10.52137225	18856.39344	0.356988955	355563573.7	0.12744111
20	54,200	10.90043619	1756.393443	-0.022074984	3084917.925	0.0004873
21	48,200	10.7831143	7756.393443	0.095246903	60161639.24	0.00907197
22	49,700	10.81376021	6256.393443	0.064600991	39142458.91	0.00417329
23	36,700	10.51053203	19256.39344	0.367829169	370808688.4	0.1352983
24	88,900	11.39526742	-32943.60656	-0.516906218	1085281213	0.26719204
25	60,800	11.01534507	-4843.606557	-0.136983865	23460524.48	0.01876458
26	64,000	11.06663836		-0.188277159	64699606.45	0.03544829
27	64,300	11.07131491	-8343.606557	-0.192953707 -0.060088611	69615770.38 118065.4663	0.00361064
28 29	56,300 53,600	10.93844981 10.88930435	-343.6065574 2356.393443	-0.010943144	5552590.056	0.00011975
30	61,100	11.02026715	-5143.606557	-0.141905942	26456688.42	0.0201373
31	27,300	10.21464198	28656.39344	0.663719222	821188885.1	0.44052321
32	79,300	11.28099341	-23343.60656	-0.402632204	544923967.1	0.16211269
33	46,400		• • • • • • • • • • • • • • • • • • • •	0.133306465	91324655.63	0.01777061
34			14456.39344	0.244912497	208987311.4	0.05998213
35	53,200		2756.393443	-0.003452472	7597704.811	1.192E-05
36	62,600	11.04452056	-6643.606557	-0.166159354	44137508.09	0.02760893
37	65,700	11.0928542	-9743.606557	-0.214493001	94937868.74	0.04600725
38	60,000	11.00209984	-4043.606557	-0.123738638	16350753.99	0.01531125
39	32,500	10.38899537	23456.39344		550202393.3	0.23947892
40	46,200	10.74073508	9756.393443	•		0.01894095
41	42,500	10.65725935			*	0.04888603
42	86,800	11.3713619	-30843.60656	-0.493000698 0.216407004	951328065.5 175731967.1	0.24304969
43	• ··· · · · · · · · · · · · · · · · · ·		13256.39344 7456.393443	0.089042126	55597803.17	0.04003199
44		10.78931908 10.01681624	33556.39344		1126031541	0.74225973
45	22,400 80,700		-24743.60656	-0.420132651	612246065.5	0.17651144
46 47		•			430827868.7	0.16773926
48				0.052600847	31994786.78	0.00276685
49	+	4		0.2842296	257807770.4	0.08078647
50		•	• · · · · · · · · · · · · · · · · · · ·	0.023215775	17275606.45	0.00053897
51	109,400				2856219082	0.52476255
52				-0.158140065	37743901.53	0.02500828
53	• • • • • • • • • • • • • • • • • • •		-21243.60656	-0.375793533	451290819.6	0.14122078
54		11.31325427	-25943.60656	-0.434893067		0.18913198
55			-18343.60656		336487901.5	0.11390964
56			-3443.606557	-0.113688302		0.01292503
57				-0.406408169	559020131	0.1651676
58					1342753902	0.31101057
59						0.00033776
60	+				+	0.00907197
61	34,900		21056.39344	0.418119095	443371704.8	0.17482358
Column Sum	3,413,340	 * ** ** ** ** ** ** ** ** ** ** ** ** *	÷ · · · · · · · · · · · · · · · · · · ·	ļ	21358403607	6.61308965
Column Sum/N	55,956	10.8783612		·	355073303 4	0.11021816
Column Sum/(N-					355973393.4 18867.25718	0.11021816
SQRT(Cotumn Sur	(N-1))				10001.23110	0,33199121
					Transformed conv	verted
		+	Untransformed	Transformed	to Untransformed	
	t	Mean	55956.39344		53016.64518	
		5td Dev	18867.25718	•		
	-	Permit Limit	93030.5538	· · · · · · · · · · · · · · · · · · ·		
		1	1	1		
		Table 3-2 Consta	nt = 1.965			

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CALCULATIONS FO	OR NEW PERMIT I	IMITS				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	•	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Total Solids	Total Solids	Minus Untransformed	Minus Transforme	Column D	Column E
	(mg/L)	(mg/L)	Total Solids Value	Total Solids Value	Squared	Squared
1	58,300	10.97335737	-2343.606557	-0.094996169	5492491.696	0.00902427
	35,800	10.48570317	20156.39344	0.392658031	406280196.6	0.15418033
3		10.4744671	20556.39344	0.403894104	422565311.4	0.16313045
4	70,140	11.15824852	-14183.60656	-0.279887321	201174695	0.07833691
5	109,000	11.59910316	-53043.60656	-0.720741958	2813624197	0.51946897 0.00217663
		10.83170686 10.82377031	5356.393443 5756.393443	0.046654348 0.054590897	28690950.71 33136065.47	0.00217883
8	69,900	11.15482093	-13943.60656	-0.276459725	194424163.8	0.07642998
9	46,300	10.74289724	9656.393443	0.135463963	93245934.32	0.01835049
10	51,300		4656.393443	0.032915172	21681999.89	0.00108341
11	42,100	10.64780302	13856.39344	0.230558183	191999639.2	0.05315708
12	73,600	11.2064003	-17643.60656	-0.328039102	311296852.4	0.10760965
13	30,600	10.32875529	25356.39344	0.549605915	642946688.4	0.30206666
14	39,100		16856.39344	0.304483457	284137999.9	0.09271018
15	46,600	10.74935582	9356.393443	0.129005383 0.367829169	87542098.25 370808688.4	0.01664239 0.1352983
16 17	36,700 48,600	10.51053203 10.79137881	19256.39344 7356.393443	0.086982393	54116524.48	0.00756594
18	55,100	10.916905	856.3934426	-0.038543792	733409.7286	0.00148562
19	37,100	10.52137225	18856.39344	0.356988955	355563573.7	0.12744111
20	54,200	10.90043619	1756.393443	-0.022074984	3084917.925	0.0004873
21	48,200	10.7831143	7756.393443	0.095246903	60161639.24	0.00907197
22	49,700		6256.393443	0.064600991	39142458.91	0.00417329
23	36,700		19256.39344	0.367829169	370808688.4	0.1352983
24	88,900		-32943.60656	-0.516906218	1085281213	0.26719204
25	60,800	11.01534507	-4843.606557	-0.136983865	23460524.48	0.01876458 0.03544829
26 27	64,000 64,300	11.06663836 11.07131491	-8043.606557 -8343.606557	-0.188277159 -0.192953707	64699606.45 69615770.38	0.03544629
28	#	10.93844981	-343.6065574	-0.060088611	118065.4663	0.00361064
29			2356.393443	-0.010943144	5552590.056	0.00011975
30	4	11.02026715	-5143.606557	-0.141905942	26456688.42	0.0201373
31	27,300	10.21464198	28656.39344	0.663719222	821188885.1	0.44052321
32		11.28099341	-23343.60656	-0.402632204	544923967.1	0.16211269
33	46,400		9556.393443	0.133306465	91324655.63	0.01777061
34			14456.39344	0.244912497	208987311.4	h
35	53,200	10.88181368	2756.393443	-0.003452472	7597704.811 44137508.09	1.192E-05 0.02760893
36 37	62,600 65,700	11.04452056 11.0928542	-6643.606557 -9743.606557	-0.166159354 -0.214493001	94937868.74	0.02760893
38	60,000		-4043.606557	-0.123738638	16350753.99	0.01531125
39	32,500	10.38899537	23456.39344	0.489365835	550202393.3	0.23947892
40		10.74073508	9756.393443	0.137626126		0.01894095
41	42,500	10.65725935	13456.39344	0.221101848	181074524.5	0.04888603
42	86,800	11.3713619	-30843.60656	-0.493000698	951328065.5	0.24304969
43		10.6619542	13256.39344	0.216407004	175731967.1	0.04683199
44		10.78931908	7456.393443	0.089042126	55597803.17	0.0079285
45	22,400	10.01681624	33556.39344	0.861544965	1126031541	0.74225973
46	80,700 35,200	11.29849385 10.46880136	-24743.60656 20756.39344	-0.420132651 0.409559842	612246065.5 430827868.7	0.17651144 0.16773926
47 48		10.82576036	5656.393443	0.409559842	31994786.78	0.00276685
49		10.5941316	16056.39344	0.032800847	257807770.4	0.00278683
50			4156.393443	0.023215775		<u>+ </u>
51	109,400			-0.724404966	·	0.52476255
52	62,100	11.03650127	-6143.606557	-0.158140065	37743901.53	0.02500828
53		11.25415474	-21243.60656	-0.375793533	451290819.6	0.14122078
54		11.31325427	-25943.60656	-0.434893067	673070721.2	0.18913198
55	•		-18343.60656	-0.337505028	336487901.5	0.11390964
56			-3443.606557	-0.113688302	11858426.12 559020131	0.01292503
57			-23643.60656 -36643.60656	-0.406408169 -0.557683217	1342753902	0.1651676 0.31101057
58 59	+		1956.393443	-0.018378122		0.00033776
60		10.7831143	7756.393443	0.095246903	60161639.24	0.00033770
61	34,900	🌬 a como o como em como o como e	21056.39344	0.418119095	443371704.8	0.17482358
Column Sum	3,413,340	· · · · · · · · · · · · · · · · · · ·		1	21358403607	6.61308965
Column Sum/N	55,956	10.8783612		I		
Column Sum/(N-1	1)				355973393.4	0.11021816
SQRT(Column Sur	m/(N-1))			ļ	18867.25718	0.33199121
	ļ		1		<u>_</u>	L
	ļ		L	<u> </u>	Transformed conv	
			Untransformed	Transformed	to Untransformed	<u> </u>
		Mean Std Dov	55956.39344	10.8783612	53016.64518 1.393740592	<u> </u>
	 	Std Dev Permit Limit	18867.25718 93030.5538	0.331991206 11.53072392		
		i simile Emile	55050.5550	, , , , , , , , , , , , , , , , , , , ,		
		Table 3-2 Consta	nt = 1.965	1	İ	
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CALCULATIONS FO		+				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
Sample Number	Untransformed	Transformed	Untransformed Mean Minus Untransformed			Column E
Sample Number	(mg/L)	(mg/L)	Total Vol. Solids Val	form of the same of the		Squared
1	45,300	10.72106231	-6529.508197	-0.247615014	42634477.29	0.0613132
2	· · · · · · · · · · · · · · · · · · ·	9.942708266	17970.4918	0.530739032	322938575.7	0.28168392
3		9.764225485	21370.4918	0.709221813	456697919.9	0.50299558
4		10.8704714	-13829.5082	-0.397024101	191255297	0.15762814
5		11.39975677	-50529.5082	-0.926309469	2553231199	0.85804923
7		10.44290063 10.28192399	4470.491803 9570.491803	0.030546665 0.191523309	19985296.96 91594313.36	0.0009331 0.03668118
8	46,800	10.75363848	-8029.508197	-0.280191184	64473001.88	0.0785071
9	26,200	10.17351469	12570.4918	0.299932608	158017264.2	0.08995957
10	32,900	10.40122794	5870.491803	0.072219361	34462674.01	0.00521564
11	25,700	10.15424627	13070.4918	0.319201027	170837756	0.1018893
12	58,100 12,800	10.96992094 9.45720045	-19329.5082 25970.4918	-0.496473645	373629887.1 674466444.5	0.24648608 1.03275766
14	28,900	10.27159687	9870.491803	1.016246848 0.201850424	97426608.44	0.04074359
15	27,000	10.20359214	11770.4918	0.269855153	138544477.3	0.0728218
16	19,600	9.883284845	19170.4918	0.590162453	367507756	0.34829172
17	35,800	10.48570317	2970.491803	-0.012255875	8823821.553	0.00015021
18	38,500	10.55841352	270.4918033	-0.084966223	73165.81564	
19 20	24,200 35,300	10.09410791 10.47163824	14570.4918 3470.491803	0.379339386 0.001809055	212299231.4 12044313.36	0.14389837 3.2727E-06
21	26,400	10.18111929	12,370	0.292328009	153029067.5	0.08545566
22	33,300	10.41331268	5,470	0.060134622	29926280.57	0.00361617
23	21,200	9.961756461	17,570	0.511690837	308722182.2	0.26182751
24		11.05405958	-24,430	-0.580612282	596800870.7	0.33711062
25	44,000	10.69194491	-5,230	-0.218497615	27347755.98	
26 27	44700 49400	10.70772878 10.8077057	-5,930 -10,630	-0.234281483 -0.334258405	35159067.45 112986444.5	0.05488781
28	40700	10.61398337	-1,930	-0.140536074	3723001.881	0.01975039
29	38,600		170	-0.087560258	29067.45499	0.0076668
30	🛊 i i i i i i i i i i i i i i i i i i i	11.33976185	-45,330	-0.866314548	2054764313	0.7505009
31	39,300	10.5789798	-530	-0.1055325	280378.9304	0.01113711
32	20,700	9.937888979	18,070	0.535558318	326542674	+
33		11.00708738	-21,530	-0.533640085	463519723.2	0.28477174
34 35	33,600 29300		5,170 9,470	0.051165952 0.188104503	26733985.49 89690215	0.00261795
36	38800	\$	-30	-0.092728228	870.7336737	0.00859852
37	46900		-8,130	-0.282325657	66088903.52	
38	45000	10.71441777	-6,230	-0.240970471	38806772.37	0.05806677
39	36800	10.51325312	1,970	-0.039805826	3882837.947	0.0015845
40	18600	•	20,170	0.642530438	406848739.6	
41 42	30,800 25,000		7,970 13,770	0.138177329 0.346816194	63528739.59 189626444.5	0.01909297 0.12028147
43	58,000	10.96819829	-19,230	-0.494750992	369773985.5	0.24477854
44	27,100		11,670	4 · · · · · · · · · · · · · · · · · · ·	136200378.9	
45	26,800	10.19615717	11,970	0.277290131	143292674	0.07688982
46	10,300	9.239899174	28,470		810568903.5	1.52164097
47	61,600	11.02841715	-22,830		521186444.5	4
48	22,900	10.03889219		0.434555108	251872510.1 9427919.914	0.18883814 8.9466E-05
4 9 50	35,700 24,400		3,070 14,370	-0.00945867 0.371108886	206511034.7	4
51	36,900	10.51596683	1,870	-0.042519532	3498739.586	
52	+	10.67821472	-4,630	-0.204767422	21432346.14	0.0419297
53	70,300	11.16052708	-31,530	-0.68707978	994109887.1	0.47207862
54	•	10.96474405	-19,030	-0.491296757	362122182.2	0.2413725
55	47,600	10.77058804	-8,830 -5,430		77960215 29479559.26	
56 57	44,200 63,400	10.69648007 11.05721914	-5,430 -24,630	-0.22303277 -0.583771843	606612674	0.04974362 0.34078956
58	70,500	11.16336799	-31,730	-0.689920691	1006761690	
59		10.56100756	170	-0.087560258	29067.45499	0.0076668
60	34,100	10.43705266	4,670	0.036394634	21813493.68	0.00132457
61	20,000	9.903487553	18,770	0.569959745	352331362.5	0.32485411
Column Sum	2,365,000	638.8802852		<u></u>	16913966885	11.663065
Column Sum/N Column Sum/(N-1	38,770	10.4734473			281899448.1	0.19438442
SQRT(Column 5um					16789.86147	0.44089048
Service dulin 3di]					
					Transformed conv	verted
			Untransformed	Transformed	to Untransformed	T
	ļ	Mean	3 8,770		35363.91743	
		Std Dev	16789.86147		1.55409049	
		Permit Limit	71762.56959	11.33979709	84102.96428	
	ł · · · · · · · · · · · · · · · · · · ·	Table 3-2 Consta	nt = 1.965			
		1.0010 0 2 CONSTA		<u> </u>		L

2 67,247 1.11612769 11303,55556 0.18832019 1277705862 0.0146 3 3-74,25 10.95825030 2125-55556 0.276724678 446289097.5 0.0476 4 60,956 11.01794038 17592.55556 0.217019324 30.9498011 0.0476 5 73,256 11.01474238 5314.555556 0.32698741 573150200.3 0.06976 6 54,610 10.9079723 23940.55556 0.32698741 573150200.3 0.069878 0.0008	OALOUR ATIONS FO	S ALEMA DEDIMENT LU	(NTC			1	T
Sample Number		T	•	Column D	Column E	Column E	Column G
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57 55,259 10.9197865 23,292 0.315173204 542496560.2 0.0993 58 58,049 10.96904276 20,502 0.265916945 420313780.2 0.0707 59 57,818 10.96505542 20,733 0.269904281 429838859.9 0.0728 60 55,617 10.92624419 22,934 0.308715517 525947970.4 0.0953 61 63,379 11.05688786 15,172 0.17807185 230176098 0.0317 62 58,238 10.97229334 20,313 0.262666364 412599913.2 0.0688 63 43,133 10.67204364 35,418 0.562916061 125403242 0.3168 Column Sum					0.130107748	145384646	0.01692803
58 58,049 10.96904276 20,502 0.265916945 420313780.2 0.0707 59 57,818 10.96505542 20,733 0.269904281 429838859.9 0.0728 60 55,617 10.92624419 22,934 0.308715517 525947970.4 0.0953 61 63,379 11.05688786 15,172 0.17807185 230176098 0.0317 62 58,238 10.97229334 20,313 0.262666364 412599913.2 0.0688 63 43,133 10.67204364 35,418 0.562916061 1254403242 0.3168 Column Sum/N 78,551 11.23495971 28856030434 4.6066 Column Sum/(N-1)) 21573.5914 0.2725 Transformed to Untransformed Mean 78,551 11.23495971 75732.27523 Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 11.77058151 129389.3702	57			23,292	0.315173204	542496560.2	0.09933415
60 55,617 10.92624419 22,934 0.308715517 525947970.4 0.0953 61 63,379 11.05688786 15,172 0.17807185 230176098 0.0317 62 58,238 10.97229334 20,313 0.262666364 412599913.2 0.0685 63 43,133 10.67204364 35,418 0.562916061 1254403242 0.3166 Column Sum 4,948,685 707.8024615 28856030434 4.6066 Column Sum/N 78,551 11.23495971 465419845.7 0.0743 SQRT(Column Sum/(N-1)) 21573.5914 0.2725 Wean 78,551 Transformed to Untransformed 78,551 Transformed to Untransformed 78,551 11.23495971 75732.27523 Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 111.77058151 129389.3702	58	58,049	10.96904276		0.265916945	420313780.2	0.07071182
61 63,379 11.05688786 15,172 0.17807185 230176098 0.0317 62 58,238 10.97229334 20,313 0.262666364 412599913.2 0.0688 63 43,133 10.67204364 35,418 0.562916061 1254403242 0.3168 Column Sum 4,948,685 707.8024615 28856030434 4.6066 Column Sum/N 78,551 11.23495971 465419845.7 0.0743 SQRT(Column Sum/(N-1)) 21573.5914 0.2725 Mean 78,551 Transformed to Untransformed Transformed to Untransformed Transformed 11.23495971 75732.27523 Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 111.77058151 129389.3702	59		10.96505542	20,733			
62 58,238 10.97229334 20,313 0.262666364 412599913.2 0.0688 63 43,133 10.67204364 35,418 0.562916061 1254403242 0.3166 Column Sum 4,948,685 707.8024615 28856030434 4.6066 Column Sum/N 78,551 11.23495971 465419845.7 0.0743 SQRT(Column Sum/(N-1)) 21573.5914 0.2725 Untransformed Transformed to Untransformed Transformed to Untransformed Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 111.77058151 129389.3702					•		0.09530527
63 43,133 10.67204364 35,418 0.562916061 1254403242 0.3168 Column Sum 4,948,685 707.8024615 28856030434 4.6066 Column Sum/N 78,551 11.23495971 465419845.7 0.0743 SQRT(Column Sum/(N-1)) 21573.5914 0.2725 Untransformed Transformed to Untransformed Mean 78,551 11.23495971 75732.27523 Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 111.77058151 129389.3702	61		+				
Column Sum Column Sum/N 4,948,685 (707.8024615) 28856030434 (4.6066) 4,0666 Column Sum/N (N-1) 11.23495971 465419845.7 (0.0743) SQRT(Column Sum/(N-1)) 21573.5914 (0.2725) 0.2725 Untransformed Mean Transformed to Untransformed To Untransformed To Std Dev 11.23495971 (0.272581071 1.31334993) 75732.27523 (0.272581071 1.31334993) Std Dev 21573.5914 (0.272581071 1.31334993) 11.277058151 129389.3702 129389.3702					<u> </u>		
Column Sum/N 78,551 11.23495971 465419845.7 0.0743				35,418	0.562916061	* · · · · · · · · · · · · · · · · · · ·	0.31687449
Column Sum/(N-1)			•			28856030434	4.60662731
SQRT(Column Sum/(N-1)) 21573.5914 0.2725 Transformed converted Untransformed Transformed to Untransformed to Untransformed Transformed to Untransformed Std Dev 21573.5914 0.272581071 1.31334993 Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 111.77058151 129389.3702			11.23495971		ļ		ļ
Untransformed Untransformed to Untransformed Untransformed 11.23495971 75732.27523 Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 11.77058151 129389.3702		·	ļ				0.07430044
Untransformed Transformed to Untransformed	SQRT(Column Sum	/(N-1))	ļ			21573.5914	0.27258107
Untransformed Transformed to Untransformed		ļ <u></u>				<u> </u>	1
Mean 78,551 11.23495971 75732.27523 Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 11.77058151 129389.3702						•	erted
Std Dev 21573.5914 0.272581071 1.31334993 Permit Limit 120942.6626 11.77058151 129389.3702						•	
Permit Limit 120942.6626 11.77058151 129389.3702							
		<u> </u>				•	ļ
Table 3-2 Constant = 1.965			Permit Limit	120942.6626	11.77058151	129389.3702	ļ
Table 3-2 Constant = 1.965			 	l		ļ	ļ
		l	Table 3-2 Constant	t = 1.965	l	i	I

Column A Sample Number	Column B Untransformed Oil & Grease	Column C Transformed Oil & Grease	Column D Untransformed Mean Minus Untransformed	Column E Transformed Mean	Column F	Column G
			Milius Officialistoffied	Minus Transformed	Column D	Column E
1	(mg/L)	(mg/L)	Oil & Grease Value	Oil & Grease Value	Squared	Squared
	4,950	8.507142856	16798.91452	1.30245035	282203528.9	1.6963769
2	10,100	9.220290703	11648.91452	0.589302503	135697209.4	0.34727744
3		9.000853147	13638.91452	0.808740058	186019989.2	0.6540604
5	19,700 29,800	9.888373915 10.30226367	2048.914516 -8051.085484	-0.078780709 -0.492670467	4198050.694 64819977.47	0.0062064
6	14,600	9.588776808	7148.914516	0.220816398	51106978.76	0.04875988
7	4,500	8.411832676	17248.91452	1.39776053	297525052	1.953734
8	20,100	9.908475094	1648.914516	-0.098881889	2718919.082	0.0097776
9	6,100	8.71604405	15648.91452	1.093549155	244888525.5	1.19584975
10	7,660	8.943767263	14088.91452	0.865825943	198497512.2	0.7496545
	13,669	9.522885774	8079.914516	0.286707431	65285018.59	0.0822011
12	22,352	10.01467108	-603.0854839	-0.205077876	363712.1009	0.04205694
13	6,535	8.784927626	15213.91452	1.024665579	231463194.9	1.0499395
14 15	23,013 26,415	10.04381455 10.18168731	-1264.085484 -4666.085484	-0.234221347 -0.372094104	1597912.111 21772353.74	0.0548596
16	14,979	9.614404499	6769.914516	0.195188706	45831742.56	0.0380986
17	51,903	t ·	-30154.08548	-1.047538666	909268871.4	1.0973372
18	32,696	10.39500803	-10947.08548	-0.58541482	119838680.6	0.3427105
19	13,433	9.505469645	8315.914516	0.30412356	69154434.24	0.09249114
20	15,008	9.616338671	6740.914516	0.193254534	45439928.51	0.0373473
21	14,123	9.555559953	7625.914516	0.254033252	58154572.21	0.0645328
22	18,779	9.840494503	2969.914516	-0.030901298	8820392.233	0.0009548
23	16,179	9.691469384	5569.914516	0.118123821	31023947.72	0.0139532
24	30,084	10.31174875	-8335.085484	-0.502155543	69473650.02	0.2521601
25 26	25,340 22,721	10.14013945 10.03104489	-3591.085484 -972.0854839	-0.330546248 -0.221451681	12895894.95 944950.188	0.10926082
27	56793	10.03104489	-35044.08548	-1.137575152	1228087927	1.2940772
28	50204	10.82384998	-28455.08548	-1.014256778	809691889.9	1.0287168
29	39,360	10.58050535	-17611.08548	-0.770912146	310150331.9	0.59430554
30	36,286	10.49918727	-14537.08548	-0.689594066	211326854.4	0.4755399
31	40,968	10.62054655	-19219.08548	-0.810953348	369373246.8	0.6576453
32	17,648	9.778377741	4100.914516	0.031215464	16817499.87	0.0009744
33	31,841	10.36851005	-10092.08548	-0.558916841	101850189.4	0.31238804
34	16,791	9.728598308	4957.914516	0.080994898	24580916.35	0.0065601
35	18098	9.803556714	3650.914516	0.006036491	13329176.8	3.6439E-0
36	13526	9.512369038	8222.914516	0.297224167	67616323.14	0.0883422
37 38	35005	10.46324619	-13256.08548 3129.914516	-0.653652982 -0.022344638	175723802.4 9796364.878	0.4272622
39	18619 13579	9.831937844 9.516279761	8169.914516	0.293313445	66747503.2	0.0860327
40	9103	9.116359309	12645.91452	0.693233897	159919153.9	0.4805732
41	5,134	8.543640361	16,615	1.265952844	276055384.4	1.602636
42	10,898	9.296334565	10,851	0.51325864	117742345.8	0.2634344
43	14,635	9.591171199	7,114	0.218422006	50607779.74	0.0477081
44	13,504	9.510741217	8,245	0.298851989	67978615.38	0.0893125
45	33,710	10.42554981	-11,961	-0.615956603	143067566	0.3794025
46			16,711	1.284828748	279254664	1.6507849
47	22,771	10.03324308	•	-0.22364987	1044658.736	0.0500192
48	11,239	9.327118458	10,510	0.482474747	110464609.2	0.2327818
49	21,140	9.958922259	-19,180	-0.149329054	370776.888 367875679.2	0.0222991
50 51	40,929 34,066	10.61959414 10.4360551	-19,180 -12,317	-0.810000932 -0.626461893	151710594.8	0.8361013
52	49,715	10.81406198		-1.004468772	782101937.3	1.0089575
53	23,065	10.0460716		-0.236478391	1732081.001	0.0559220
54	24,258	10.09650174		-0.286908533	6295509.965	0.0823165
55	31,960	10.3722404	-10,211	-0.562647194	104266266.8	0.3165718
56	16,153	9.68986107	5,596	0.119732135	31314259.27	0.0143357
57	22,319	10.01319361	-570	-0.203600407	324997.4589	0.0414531
58	25,354	10.14069179		-0.331098582	12996641.35	0.1096262
59	27,124	10.20817422	-5,375	-0.398581018	28891543.96	0.1588668
60	26,426	10.18210365	<u> </u>	-0.372510448	21875128.62 105450605.3	0.1387640
61	11,480	9.34836167	t	0.461231536 0.978319468	222126667.9	0.2127345
Column Sum	6,845 1,348,433	8.831273738 608.1947787		0.57 65 1 5466	9607564493	24.306367
Column Sum/N	21,749	9.809593205			200.001103	
Column Sum/(N-1)					157501057.3	0.3984650
SQRT (Column Sum					12549.94252	0.6312408
					Transformed conv	erted
			Untransformed	Transformed	to Untransformed	
				0.0000000000	10207 17002	
		Mean	21,749		18207.57883	
	-	Std Dev	12549.94252	0.631240873	1.879941901	
	-					

1	R NEW PERMIT L		Caluma D	C-1 5	C-1 F	Caluma C
	Column B	Column C	Column D	Column E	Column F	Column G
		Transformed	Untransformed Mean	Transformed Mean		C-1. =- 5
Sample Number	Total Phos	Total Phos	Minus Untransformed		· · · · · · · · · · · · · · · · · · ·	Column E
1	(mg/L)	(mg/L) 6.478509642	Total Phos Value		Squared 70424 07822	5quared 0.0740433
	651		265.3770492	0.272109115	70424.97823	
2	502 526	6.21860012	414.3770492	0.532018637	171708.3389 152394.2405	0.2830438 0.2355331
4	1,040	6.265301213	390.3770492	0.485317544	∤	
5	1,040	6.946975992	-123.6229508	-0.196357235	15282.63397	0.0385561
6	915	7.13089883 6.818924065	-333.6229508	-0.380280073	111304.2733	0.1446129
7	897	6.799055862	1.37704918 19.37704918	-0.068305308 -0.048437105	1.896264445 375.4700349	0.0023461
8	985	6.892641641	-68.62295082	-0.142022884	4709.109379	0.0023461
9	798	6.682108597	118.3770492	0.06851016	14013.12577	0.020176
10	655	6.484635236	261.3770492	0.265983521	68317.96184	0.0040930
11	1,072	6.977281342	-155.6229508	-0.226662585	24218.50282	0.0513759
12	608	6.410174882	308.3770492	0.340443875	95096.40446	0.1159020
13	734	6.598509029	182.3770492	0.152109728	33261.38807	0.0231373
14	1,740	7.461640392	-823.6229508	-0.711021635	678354.7651	0.5055517
15	674	6.513230111	242.3770492	0.237388646	58746.63397	0.0563533
16	2,530	7.835974582	-1613.622951	-1.085355825	2603779.027	1.1779972
17	1,040	6.946975992	-123.6229508	-0.196357235	15282.63397	0.0385561
18	1,270	7.146772179	-353.6229508	-0.396153422	125049.1913	0.1569375
19	618	6.426488457	298.3770492	0.3241303	89028.86348	0.1050604
20	620	6.429719478	296.3770492	0.320899279	87839.35528	0.1029763
21	512	6.238324625	404.3770492	0.512294132	163520.7979	0.2624452
22	950	6.856461985	-33.62295082	-0.105843228	1130.502822	0.0112027
23	662	6.495265556	254.3770492	0.255353201	64707.68315	0.0652052
24	1,180	7.073269717	-263.6229508	-0.32265096	69497.0602	0.1041036
25	1,110	7.012115294	-193.6229508	-0.261496537	37489.84708	0.0683804
26	789	6.670766321	127.3770492	0.079852436	16224.91266	0.0063764
27	1,110	7.012115294	-193.6229508	-0.261496537	37489.84708	0.0683804
28	997	6.90475077	-80.62295082	-0.154132013	6500.060199	0.0237566
29	612	6.416732283	304.3770492	0.333886475	92645.38807	0.1114801
30	933	6.838405201	-16.62295082	-0.087786444	276.322494	0.0077064
31	361	5.888877958	555.3770492	0.861740799	308443.6668	0.742597
32	1,400	7.244227516	-483.6229508	-0.493608759	233891.1586	
33	666	6.501289671	250.3770492	0.249329087	62688.66676	0.0621649
34	502	6.21860012	414.3770492	0.532018637	171708.3389	0.2830438
3 5	791	6.673297968	125.3770492	0.077320789		0.005978
36	940	6.845879875	-23.62295082	-0.095261118	• • • •	
37	1,100	7.003065459	-183.6229508	-0.252446702	* · · · · · · · · · · · · · · · · · · ·	0.0637293
38	817	6.705639095	99.37704918	0.044979662	9875.797904	0.0020231
39	525	6.263398263	391.3770492	0.487220494	+	0.2373838
40	652	6.480044562	264.3770492	0.270574195	69895.22413	•
41	667	6.502790046	249.3770492	0.247828711	62188.91266	
42	2,200	7.696212639	-1283.622951	-0.945593882	1647687.88	+
43	626	6.439350371	290.3770492	0.311268386	84318.83069	
44	691	6.538139824	225.3770492	0.212478933	50794.8143	0.045147
45	609	6.411818268	307.3770492	0.338800489	94480.65036	0.1147857
46	1,070	6.975413927	-153.6229508	-0.22479517	23600.01102	0.0505328
47	846	6.74051936	70.37704918	0.010099397	4952.929051	0.00010
48	975	6.882437471 6.459904454	-58.62295082	-0.131818714 0.290714303	 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	0.0173761
49			277.3770492		76938.02741	0.0845148
50	935	6.840546529	-18.62295082 -373.6229508	-0.089927772	+	0.00808
51 52	1,290	7.162397497	-373.6229508 -123.6229508	-0.41177874 -0.196357235		0.0385561
	1,040	6.946975992		-0.196357235	 	+ ·· — · · · · · · · · · · · · ·
53	1,450	7.279318835 7.265429723	-533.6229508	-0.528700078 -0.514810966		0.2650303
54	1,430	6.809039306	-513.6229508 10.37704918	-0.058420549	\$	0.265030.
55 ₁ 56	906 811	6.698268054	105.37704918	0.052350703		0.0034129
57	981	6.88857246	-64.62295082	-0.137953703		· carrier or con-
58	902	6.80461452	14.37704918	-0.053995763	206.6995431	0.0029155
59	771	6.647688374	145.3770492	0.102930383		0.002913
60	694	6.542471961	222.3770492	0.208146797	A CONTRACTOR OF THE PARTY OF	0.0103940
61	632	6,448889394	284.3770492	0.301729363	.	0.0910406
Column Sum	55,899	411.7877442	204.3770492	0,301723303	8887580.328	7.962887
Column Sum/N	916	6.750618757			555,550.526	1.002007.
Column 5um/(N-1)		5550,0137		ļ	148126.3388	0.132714
5QRT(Column Sum.					384.8718472	0.3643004
Sent reproduit Sollis					55-1.0110-7/2	2.30 7300
					Transformed conv	/erted
			Untransformed	Transformed	to Untransformed	
		Maan	Untransformed 916	Transformed 6.750618757	854.5873809	
		Mean Std Dev	384.8718472	#	1.439506593	l
				·	+	
		Permit Limit	1672.650229	7.466469064	1748.422207	
			1	I	1	I .

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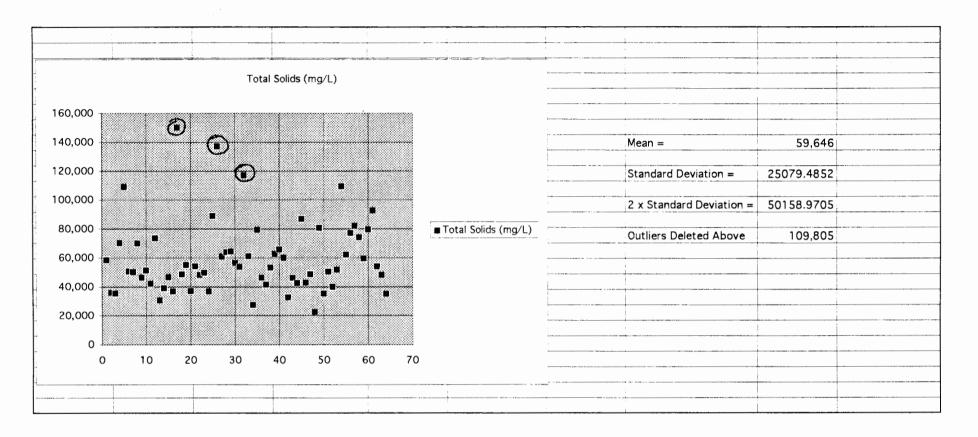
CALCULATIONS FO Column A	Column B	Column C	Column D	Column E	Column F	Column G
Column A	Untransformed	Transformed	Untransformed Mean	Transformed Mean	Column 1	
Sample Number	Total Nitrogen	Total Nitrogen	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	Total Nitrogen Value	Total Nitrogen Value		Squared
	7,000	8.853665428	-1369.032258	-0.277032399	1874249.324	0.0767469
2	5,110	8.538954683	520.9677419	0.037678345	271407.3881 561049.3236	0.0014196
3	6,380 7,850	8.760923376 8.968268811	-749.0322581 -2219.032258	-0.184290348 -0.391635782	4924104.162	0.0339629
5		8.894258825	-1659.032258	-0.317625796	2752388.033	0.1008861
6		8.919988071	-1849.032258	-0.343355042	3418920.291	0.11789269
7	1,750	7.467371067	3880.967742	1.109261962	15061910.61	1.230462
8	2,530	7.835974582	3100.967742	0.740658447	9616000.937	0.54857494
9	5,630	8.635864721	0.967741935	-0.059231692	0.936524454	0.00350839
10 11	5,120 6,900	8.540909718 8.839276691	510.9677419	0.035723311 -0.262643662	261088.0333 1610442.872	0.00127615
12	4,940	8.50512061	-1269.032258 690.9677419	0.071512418	477436.4204	0.00535103
13	<u> </u>	8.433811582	1030.967742	0.142821446	1062894.485	0.02039797
14	7,090	8.86644062	-1459.032258	-0.289807591	2128775.13	0.08398844
15	5,390	8.592300664	240.9677419	-0.015667635	58065.45265	0.00024547
16	 	8.581106517	300.9677419	-0.004473488	90581.58169	2.0012E-05
17	3,180	8.064636476	2450.967742	0.511996553	6007242.872	0.26214047
18 19	5,190 5,120	8.554488976 8.540909718	440.9677419 510.9677419	0.022144053 0.035723311	194452.5494 261088.0333	0.00049036
20	5,540	8.61974978	90.96774194	-0.043116751	8275.130073	0.00127613
21	5,040	8.525161361	590.9677419	0.051471668	349242.872	0.00264933
22	8,290	9.022805248	-2659.032258	-0.446172219	7070452.549	0.19906965
23	•	8.724207361	-519	-0.147574332	269394.4849	0.02177818
24	• · · · · · · · · · · · · · · · · · · ·	8.529121762	570.9677419	0.047511266	326004.1623	0.00225732
25	•	7.770645234	3260.967742	0.805987795	10633910.61	0.64961632
26		8.318742253 8.803874764	1530.967742 -1029.032258	0.257890776 -0.227241735	2343862.227 1058907.388	0.06650765
27 28	6660 6660	8.803874764	-1029.032258	-0.227241735	1058907.388	0.05163881
29	3940	8.278936002	1690.967742	0.297697026	2859371.904	0.08862352
30		8.411832676	1130.967742	0.164800353	1279088.033	0.02715916
31	4370	8.382518288	1260.967742	0.194114741	1590039.646	0.03768053
32	2820	7.944492164	2810.967742	0.632140865	7901539.646	0.39960207
33	•	•	3840.967742	1.08666213	14753033.19	1.18083458
34 35	6390 4820	8.762489547 8.480529207	-759.0322581 810.9677419	-0.185856519 0.096103822	576129.9688 657668.6785	0.03454265
36	1	7.962067309	2760.9677419	0.61456572	7622942.872	0.37769102
37		8.625150333	60.96774194	-0.048517304	3717.065557	0.00235393
38	•	9.173676388	-4009.032258	-0.597043359	16072339.65	0.35646077
39	5920	8.686091728	-289.0322581	-0.109458699	83539.6462	0.01198121
40		8.756210092	-719.0322581	-0.179577063	517007.3881	0.03224792
41	3490	8.157657015	2140.967742	0.418976013	4583742.872 5669007.388	0.1755409
42	3,250 4,980	•	2380.967742 650.9677419	0.490222753 0.063447859	423759.001	0.00402563
44	6,490	4	-859.0322581	-0.201384781	737936.4204	0.04055583
45		8.669055541	-189.0322581	-0.092422512	35733.19459	0.00854192
46	+	8.347590407	1410.967742	0.229042622	1990829.969	0.05246052
47	5,430		200.9677419	-0.023061384	40388.0333	0.00053183
48		9.002085433	-2489.032258	-0.425452404	6195281.582	0.18100975
49		8.519191194	620.9677419	0.057441835	385600.9365	0.00329956
50 51			1300.967742 610.9677419	0.203310208 0.055447816	1692517.066 373281.5817	0.04133504
52			-1089.032258		1185991.259	
53	T				6859329.969	0.1947769
54	!		-3299.032258		10883613.84	†
55	†		-1389.032258		1929410.614	· · · · · · · · · · · · · · · · · · ·
56	+		-3529.032258		12454068.68	0.2980815
57	4		-539.0322581	-0.150821088 -0.446172219	290555.7752 7070452.549	0.02274
58 59	+		-2659.032258 -1219.032258		1486039.646	0.065214
60	1		-1259.032258		1585162.227	0.0682219
61			-469.0322581	-0.139411021	219991.2591	0.0194354
62	5,850	8.67419694	-219.0322581	-0.097563912	47975.13007	0.0095187
Column Sum	349,120				193808141.9	8.3490426
Column Sum/N	5,631	8.576633029		ļ · · · · · · · · · · · · · · · · · · ·	2177102 655	0.1368695
Column Sum/(N-1) SQRT(Column Sum				i	3177182.655 1782.465331	0.1368695
SQRT (Column Sum	ν(N-1))				1782.403331	0.3099300
					Transformed conv	erted
	1.		Untransformed	Transformed	to Untransformed	I
	I	Mean	5,631	8.576633029	+	1
		Std Dev	1782.465331	+	1.447675043	
		Permit Limit	9133.512117	9.303602171	10977.49087	-
		Table 2 2 Const	1 065			ł
	J	Table 3-2 Constan	1.903	J	L	

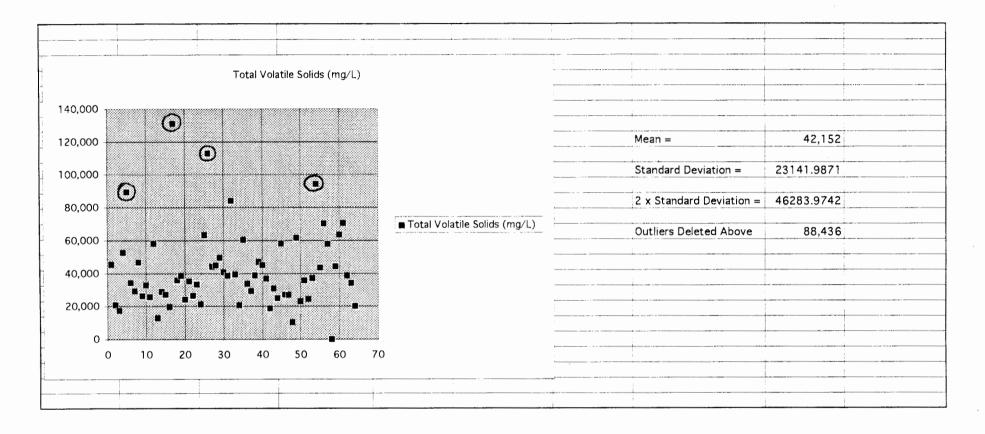
CALCULATIONS FO	OR NEW PERMIT LI	MITS				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Ammonia	Ammonia	Minus Untransformed	Minus Transformed		Column E
	(mg/L) 4,190	(mg/L) 8.340456013	Ammonia Value -538.3492063	Ammonia Value -0.267534819	Squared 289819.868	Squared 0.07157488
1		8.019612794	611.6507937	0.0533084	374116.6934	0.00284179
3		8.503094267	-1278.349206	-0.430173073	1634176.693	0.18504887
4		8.349957272	-578.3492063	-0.277036078	334487.8045	0.07674899
5		8.213381737	-38.34920635	-0.140460543	1470.661628	0.01972916
6		+	-488.3492063	-0.255529873	238484.9473	0.06529552
7		5.645446898	3368.650794	2.427474297 -0.521233038	11347808.17 3056724.947	5.89263146 0.27168388
9	·	8.594154233 8.283999304	-1748.349206 -308.3492063	-0.21107811	95079.23306	0.04455397
10			141.6507937	-0.090450122	20064.94734	0.00818122
11		8.391629968	-758.3492063	-0.318708774	575093.5188	0.10157528
12			231.6507937	-0.064474636	53662.0902	0.00415698
13		7.736307097	1361.650794	0.336614098	1854092.884	0.11330905
14 15		8.556413905 8.405143688	-1548.349206 -818.3492063	-0.48349271 -0.332222493	2397385.265 669695.4235	0.2337652 0.11037179
16		7.554858521	1741.650794	0.518062673	3033347.487	0.26838893
17		5.641907071	3369.650794	2.431014123	11354546.47	5.90982967
18	*	8.429454277	-928.3492063	-0.356533083	861832.2489	0.12711584
19			-338.3492063	-0.218625316	114480.1854	0.04779703
20	# · · · · · · · · · · · · · · · · · · ·		591.6507937	0.046750999	350050.6616	0.00218566
21 22	•	8.268731832 8.366370302	-248.3492063 -648.3492063	-0.195810638 -0.293449107	61677.32829 420356.6934	0.03834181 0.08611238
22			-548.3492063	-0.293449107	323020.8204	0.08611238
24	# ce c c c c c c c		261.6507937	-0.055664006	68461.13782	0.00309848
25	295	5.686975356	3356.650794	2.385945838	11267104.55	5.69273754
26	* · · · · · · · ·	t	-1148.349206	-0.403450003	1318705.9	0.1627719
27	 	8.548691858	-1508.349206	-0.475770664	2275117.328	0.22635772
28 29	•		-1518.349206 321.6507937	-0.477706773 -0.037806389	2305384.312 103459.2331	0.00142932
30			1.650793651	-0.129561252	2.725119678	0.01678612
31	*** · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	-68.34920635	-0.148557753	4671.614009	0.02206941
32		 * * * * * * * * * * * * * * * * * * *	1361.650794	0.336614098	1854092.884	0.11330905
33			2091.650794	0.720480094	4375003.043	0.51909157
34 35			3217.650794 -398.3492063	1.99987666 -0.233550966	10353276.63 158682.0902	3.99950666 0.05454605
36	*		1341.650794	0.327918391	1800026.852	0.10753047
37			-218.3492063	-0.188088592	47676.37591	0.03537732
38	•		-1578.349206	-0.489245363	2491186.217	0.23936103
39			-818.3492063	-0.332222493	669695.4235	0.11037179
40 41	·	8.29154651 8.003028666	-338.3492063 661.6507937	-0.218625316 0.069892528	114480.1854 437781.7727	0.04779703
42	•	·	741.6507937	0.097012834	550045.8997	0.00941149
43			591.6507937	0.046750999	350050.6616	0.00218566
44	,	,	-198.3492063	-0.182907233	39342.40766	0.03345506
45	* · · · · ·		-558.3492063	-0.272296732	311753.8362	0.07414551
46 47	1	·	241.6507937 -228.3492063	-0.061546376 -0.190669238	58395.10607 52143.36004	0.00378796 0.03635476
48	*- · · · ·		-958.3492063	-0.363061942	918433.2013	0.13181397
49			-218.3492063	-0.188088592	47676.37591	0.03537732
50	+	8.22684089	-88.34920635	-0.153919696	7805.582263	0.02369127
51	† f		391.6507937	-0.01656128	153390.3442	0.00027428
52	1		-188.3492063 -2158.349206	-0.180306451	35475.42353	0.03251042
53 54	+	+	-2158.349206 -1298.349206	-0.594414656 -0.434221661	4658471.297 1685710.662	0.35332878 0.18854845
55		8.531096097	-1418.349206	-0.458174902	2011714.471	0.20992424
56			1881.650794	0.594186369	3540609.709	0.35305744
57	1		-738.3492063	-0.314163312	545159.5505	0.09869859
58			511.6507937	0.020943115	261786.5346	0.00043861
59 6 0			-898.3492063 -1318.349206	-0.349961318 -0.438253925	807031.2965 1738044.63	0.12247292 0.1920665
61	· · · · · · · · · · · · · · · · · · ·	8.289037098	-328.3492063	-0.216115904	107813.2013	0.04670608
62			471.6507937	0.008284718	222454.4712	6.8637E-05
63	3,490		161.6507937	-0.084735821	26130.97909	0.00718016
Column 5um	230,054	508.5940352			97235722.32	27.2974108
Column Sum/N	3,652	8.072921194	ļ		1560210 102	0.44020000
Column Sum/(N-1 SQRT(Column Sum		 		· · · · · · · · · · · · · · · · · · ·	1568318.102 1252.325078	0.44028082 0.6635366
ock (coliniii sau	, A ₄₋ 137	t · · · · · · · · · · · · · · · · · · ·			1232.323078	0.0033300
		İ		T	Transformed conv	erted
	T	I	Untransformed	Transformed	to Untransformed	
		Mean	3,652	8.072921194	3206.454839	
		Std Dev	1252.325078	0.6635366	1.941647035	
	ļ · · · · · · · · · · · · · · · · · · ·	Permit Limit	6112.469573	9.376770613	11810.81142	
		Table 3-2 Constan	l t = 1.965			
		C L Constan		· · · · · · · · · · · · · · · · · · ·		

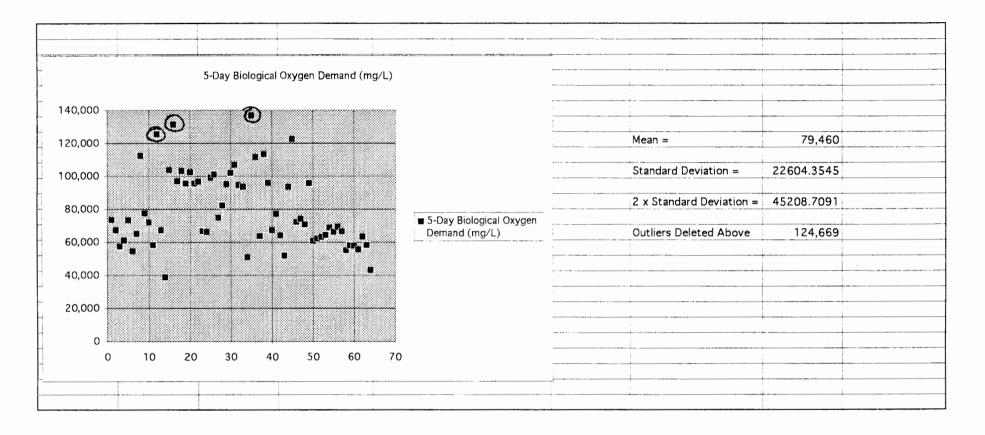
	OR NEW PERMIT LI		Column	Column	Column 5	Column
Column A	Column B Untransformed	Column C Transformed	Column D Untransformed Mean	Column E Transformed Mean	Column F	Column G
Sample Number	pH	pH	Minus Untransformed	Minus Transformed	Column D	Column E
	(pH Units)	(pH Units)	pH Value	pH Value	Squared	Squared
1	6.86	1.925707442	-0.252903226	-0.038152461	0.063960042	0.0014556
2	6.5	1.871802177	0.107096774	0.015752804	0.011469719	0.0002481
3	6.93	1.935859813	-0.322903226	-0.048304832	0.104266493	0.0023333
5	6.88 6.5	1.928618652 1.871802177	-0.272903226 0.107096774	-0.041063671 0.015752804	0.074476171 0.011469719	0.0016862
6	6.73	1.906575144	-0.122903226	-0.019020163	0.015105203	0.00024817
7	6.98	1.943048917	-0.372903226	-0.055493936	0.139056816	0.0030795
8	7.13	1.964311234	-0.522903226	-0.076756254	0.273427784	0.0058915
9	6.85	1.924248652	-0.242903226	-0.036693671	0.059001977	0.0013464
10	6.74	1.908059925	-0.132903226	-0.020504 94 4	0.017663267	0.0004204
11	6.84	1.922787732	-0.232903226	-0.035232751	0.054243913	0.0012413
12	6.18	1.821318271	0.427096774	0.066236709	0.182411655	0.004387
13 14	6.46 6.23	1.865629318 1.829376333	0.147096774 0.377096774	0.021925663 0.058178648	0.021637461 0.142201977	0.0004807 0.0033847
15	6.73	1.906575144	-0.122903226	-0.019020163	0.015105203	0.0033647
16	6.68	1.899117988	-0.072903226	-0.011563007	0.00531488	0.000133
17	6.52	1.874874376	0.087096774	0.012680605	0.007585848	0.000160
18	6.96	1.940179474	-0.352903226	-0.052624493	0.124540687	0.0027693
19	6.62	1.89009537	-0.012903226	-0.002540389	0.000166493	6.4536E-0
20	6.35	1.848454813	0.257096774	0.039100168	0.066098751	0.0015288
21	6.52	1.874874376	0.087096774 -0.102903226	0.012680605	0.007585848	0.000160
22	6.71 6.63	1.903598951 1.891604804	-0.102903226	-0.01604397 -0.004049823	0.010589074 0.000524558	0.0002574 1.6401E-0
23	6.1	1.808288771	0.507096774	0.07926621	0.257147138	0.0062831
25	6.4	1.85629799	0.207096774	0.031256991	0.042889074	0.00097
26	6.9	1.931521412	-0.292903226	-0.043966431	0.0857923	0.0019330
27	6.8	1.916922612	-0.192903226	-0.029367631	0.037211655	0.0008624
28	6.44	1.86252854	0.167096774	0.025026441	0.027921332	0.0006263
29	6.3	1.840549633	0.307096774	0.047005347	0.094308429	0.002209
30	6.2	1.824549292	0.407096774	0.063005689	0.165727784	0.0039697
31	6.4	1.85629799	0.207096774	0.031256991	0.042889074	0.00097
32 33	6.6 6.3	1.887069649 1.840549633	0.007096774 0.307096774	0.000485332 0.047005347	5.03642E-05 0.094308429	2.3555E-0 0.002209
34	6.6	1.887069649	0.007096774	0.000485332	5.03642E-05	2.3555E-0
35	6.49	1.870262531	0.117096774	0.01729245	0.013711655	0.0002990
36	6.75	1.909542505	-0.142903226	-0.021987524	0.020421332	0.0004834
37	6.76	1.91102289	-0.152903226	-0.023467909	0.023379396	0.0005507
38	6.73	1.906575144	-0.122903226	-0.019020163	0.015105203	0.0003617
39	6.71	1.903598951	-0.102903226	-0.01604397	0.010589074	0.0002574
40	6.56	1.880990603	0.047096774	0.006564378	0.002218106	4.3091E-0
41 42	6.00 6.40	1.791759469	0.607096774	0.095795512 0.031256991	0.368566493	0.0091767
43	6.50	1.85629799 1.871802177	0.207096774 0.107096774	0.031236991	0.042889074 0.011469719	0.00097
44	6.50	1.871802177	0.107096774	0.015752804	0.011469719	0.0002481
45	6.60	1.887069649	0.007096774	0.000485332	5.03642E-05	2.3555E-0
46	6.70	1.902107526	-0.092903226	-0.014552546	0.008631009	0.0002117
47	6.70	1.902107526	-0.092903226	-0.014552546	0.008631009	0.0002117
48	6.70	1.902107526	-0.092903226	-0.014552546	0.008631009	0.0002117
49	6.46	1.865629318	0.147096774	0.021925663	0.021637461	0.0004807
50	6.50	1.871802177	0.107096774	0.015752804	0.011469719	0.0002481
51	6.50	1.871802177	0.107096774 -0.092903226	0.015752804	0.011469719	0.0002481
52 53	6.70 6.70	1.902107526 1.902107526	-0.092903226	-0.014552546 -0.014552546	0.008631009 0.008631009	0.0002117
54	6.40	1.85629799	0.207096774	0.031256991	0.042889074	0.0002117
55	6.70	1.902107526	-0.092903226	-0.014552546	0.008631009	0.0002117
56	6.60	1.887069649	0.007096774	0.000485332	5.03 6 42E-05	2.3555E-0
57	7.00	1.945910149	-0.392903226	-0.058355168	0.154372945	0.0034053
58	6.80	1.916922612	-0.192903226	-0.029367631	0.037211655	0.0008624
59	6.60	1.887069649	0.007096774	0.000485332	5.03642E-05	2.3555E-0
60	6.80	1.916922612	-0.192903226	-0.029367631	0.037211655	0.0008624
61	6.70 6.51	1.902107526 1.873339456	-0.092903226 0.097096774	-0.014552546 0.014215525	0.008631009 0.009427784	0.0002117
62 Column Sum	409.64	117.0284088	0.03/090//4	0.017213323	3.162277419	0.002020
Column Sum/N	6.61	1.887554981				
Column Sum/(N-1)					0.051840613	0.0012036
SQRT(Column Sum					0.227685339	0.03469
					Transformed conv	erted
			Untransformed	Transformed	to Untransformed	
	,	Mean	6.61	1.887554981	6.603203968	
		Std Dev	0.227685339	0.034693999	1.035302857	
		Upper Permit Limit Lower Permit Limit	7.054498465 6.159695084	1.955728689 1.819381272	7.069068303 6.168040931	
		FOMEL LEHRIT FIMIL	0.139093084	1.0153012/2	0.100040931	L

CALCULATIONS FO	OR NEW PERMIT LI	MITS				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Density	Density	Minus Untransformed	Minus Transformed		Column E
	(g/mL)	(g/mL)	Density Value	Density Value 0.002146901	Squared 5.09886E-06	Squared 4.6092E-0€
!		0.029558802	0.002258065 -0.027741935	-0.027411902	0.000769615	0.00075141
3		-0.010050336	0.012258065	0.012197236	0.00015026	0.00014877
4	· ····	-0.020202707	0.022258065	0.022349608	0.000495421	0.0004995
5	1.01	0.009950331	-0.007741935	-0.00780343	5. 99376 E-05	6.0894E-05
6	4	-0.030459207	0.032258065	0.032606108	0.001040583	
7		-0.040821995	0.042258065	0.042968895	0.001785744	0.00184633
		0.009950331	-0.007741935	-0.00780343	5.99376E-05	6.0894E-05
9		-0.010050336 0.019802627	0.012258065 -0.017741935	0.012197236 -0.017655727	0.00015026 0.000314776	0.00031172
11		+	0.032258065	0.032606108	0.001040583	
12		· · · · · · · · · · · · · · · · · · ·	-0.017741935	-0.017655727	0.000314776	0.00031172
13		0	0.002258065	0.002146901	5.09886E-06	4.6092E-06
14		-0.010050336	0.012258065	0.012197236	0.00015026	
15		0.009950331	-0.007741935	-0.00780343	5.99376E-05	6.0894E-05
16		-0.030459207	0.032258065	0.032606108	0.001040583	0.00106316
17	+		0.022258065 0.012258065	0.022349608 0.012197236	0.000493421	+
19		0.010030330	0.002258065	0.002146901	5.09886E-06	4.6092E-06
20	•		0.012258065	0.012197236	0.00015026	+
21	÷	0.009950331	-0.007741935	-0.00780343	5.99376E-05	6.0894E-05
22		0.009950331	-0.007741935	-0.00780343	5.99376E-05	6.0894E-05
23	4	0.029558802	-0.027741935	-0.027411902	0.000769615	0.00075141
24		0 000050331	0.002258065	0.002146901	5.09886E-06 5.99376E-05	4.6092E-06 6.0894E-05
25 26		0.009950331	-0.007741935 -0.007741935	-0.00780343 -0.00780343	5.99376E-05	
27		·	0.012258065	0.012197236	0.00015026	•
28		0.009950331	-0.007741935	-0.00780343	5.99376E-05	
29	*	0	0.002258065	0.002146901	5.09886E-06	4.6092E-06
30	1.01	0.009950331	-0.007741935	-0.00780343	5.99376E-05	
31	*	0	0.002258065	0.002146901	5.09886E-06	
32	t	-0.010050336 0	0.012258065	0.012197236 0.002146901	0.00015026 5.09886E-06	
33		0	0.002258065	0.002146901	5.09886E-06	t
35	1	0.009950331	-0.007741935	-0.00780343	5.99376E-05	
36	*· · · · · · · · · · · · · · · · · · ·	0.009950331	-0.007741935	-0.00780343	5.99376E-05	6.0894E-05
37	7]	0	 	0.002146901	5.09886E-06	+
38		0	+	0.002146901	5.09886E-06	+
39	4	0	0.002258065	0.002146901	5.09886E-06	4
40		-0.010050336	0.012258065 0.002258065	0.012197236 0.002146901	0.00015026 5.09886E-06	+
42		0	0.002258065	0.002146901	5.09886E-06	+
43		0.009950331	-0.007741935	-0.00780343	5.99376E-05	
44	1.00	.0	0.002258065	0.002146901	5.09886E-06	4.6092E-06
45		0.019802627	-0.017741935	-0.017655727	0.000314776	**
46	•	0	0.002258065	1	5.09886E-06	
47		0.039220713	-0.037741935 0.002258065	-0.037073813 0.002146901	0.001424454 5.09886E-06	
48		0	1	0.002146901	5.09886E-06	+
50	******	0	0.002258065	0.002146901	5.09886E-06	+
51		0.009950331	-0.007741935	-0.00780343	5.99376E-05	
52	2 1	0		0.002146901	5.09886E-06	t
53	•	0		0.002146901	5.09886E-06	·
54		0.010002027		0.002146901	5.09886E-06	
55 56		0.019802627	-0.017741935 -0.007741935	-0.017655727 -0.00780343	0.000314776 5.99376E-05	+ · · · · -
57		0.009950351	*· - · · · · · · · · · · · · · · · · · ·		5.09886E-06	4
58		0	+	0.002146901	5.09886E-06	
59	· · · · · · · · · · · · · · · · · · ·	0.019802627	·		0.000314776	*
60	1.01	0.009950331	-0.007741935	-0.00780343	+	1 -
61	+	0.009950331	-0.007741935	-0.00780343	+	and the state of t
62		0.029558802	· · · · · · · · · · · · · · · · · · ·	-0.027411902	·	+
Column Sum	62.14	-	<u> </u>		0.013483871	0.01349263
Column Sum/N Column Sum/(N-1	1.00	0.002146901			0.000221047	0.00022119
SQRT(Column Sur		t		1	0.014867652	-
-Siri foordinin odi	T	1	1		1	
	1		T		Transformed conv	erted
	I	I	Untransformed	Transformed	to Untransformed	
		Mean	1.00		1.002149207	1
		Std Dev	0.014867652		•	1
		Upper Permit Limit			1	† ····
	+	Lower Permit Limit	0.973043129	-0.027077519	0.97328579	+
		Table 3-2 Constan	t = 1.965	 	t	
					·	

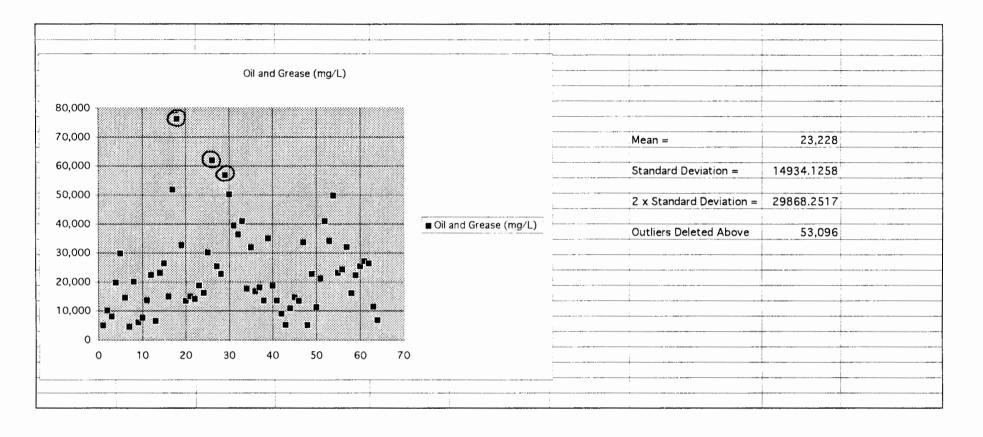
OD 93-01	1		1		1		1	1	
	No limit								
Lillies									
		Total Volatile	5-Day Biological						
	Total Solids	Solids			Total Phosphorus	Total Nitrogen		pН	Density
Month & Year	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(pH units)	(g/mL)
12/10/93	58,300			4,950		7,000	4,190	6.86	0.95
12/17/93	35,800			10,100	502		3,040	6.50	1.00
1/21/94	35,400			8,110	526		4,930 4,230	6.93 6.88	0.99
1/28/94 2/9/94	70,140 109,000			19,700	1,040 1,250	7,850 7,290	3,690	6.50	0.98
2/9/94	50,600			29,800 14,600	915	7,290	4,140	6.73	1.01
3/09/94	50,800			4,500		1,750	283	6.98	0.97
3/24/94	69,900		112,261	20,100	3,210	14,300	9,700		0.96
4/26/94	46,300			6,100		2,530	5,400	6.85	1.0
5/3/94	51,300			7,660	798	5,630	3,960	6.74	0.99
5/23/94	42,100			13,669	655	5,120	3,510	6.84	1.02
5/30/94	73,600			22,352	1,072	6,900	4,410	6.18	0.97
6/15/94	30,600	12,800	67,282	6,535	608	4,940	3,420	6.46	1.02
6/22/94	39,100			23,013	734	4,600	2,290	6.23	1.00
7/20/94	46,600			26,415	1,740	7,090	5,200	6.73	0.99
7/27/94	36,700			14,979	674	5,390	4,470	6.68	1.0
8/16/94	150,000			51,903	2,530	5,330	1,910	6.52	0.94
8/25/94	48,600			76,256		3,180	282	5.47	0.97
9/20/94	55,100			32,696		5,190	4,580	6.96	0.98
9/27/94	37,100			13,433	618	5,120			0.99
10/1/94	54,200			15,008		5,540	3,060 3,900	6.35	0.99
10/7/94	48,200			14,123	512		4,300		
11/17/94	49,700			18,779 16,179	950 662	8,290	4,300	6.71 6.63	1.01
11/23/94 12/14/94	36,700 88,900			30,084	1,180	6,150 5,060	3,390		1.03
12/21/94	137,000			61,901	1,110		295		1.00
1/27/95	60,800		74,889	25,340	789	4,100	4,800		1.0
1/31/95	64,000	· · · · · · · · ·	82,339	22,721	1,110		5,160		1.01
2/25/95	64,300		95,139	56,793		6,660	5,170		0.99
3/2/95	56,300			50,204	612	3,940	3,330		1.01
3-03-95	53,600			39,360			3,650	6.30	1.00
3-11-95	117,000		94,628	36,286	3,830	4,370	3,720	6.20	1.0
4-07-95	61,100	39,300		40,968	3,100	2,820	2,290	6.40	1.00
4-13-95	27,300	20,700	50,893	17,648	361	1,790	1,560	6.60	0.99
5-03-95	79,300	60,300	136,750	31,841	1,400		434		1.00
5-10-95	46,400	33,600	111,611	16,791	666	4,820	4,050		1.00
6/28/95	41,500			18,098			2,310		1.0
7/5/95	53,200			13,526	791	5,570	3,870		1.01
7/6/95	62,600			35,005	940	9,640	5,230	6.76	1.00
7/26/95	65,700			18,619	1,100		4,470		1.00
08-01-95	60,000			13,579	817	6,350	3,990		1.00
8/9/95	32,500	÷	·	9,103	525	3,490	2,990		0.99
09-14-95	46,200			5,134			2,910		1.00
09-28-95	42,500			10,898			3,060		1.00 1.01
10-19-95	86,800			14,635 13,504	2,200 626		3,850 4,210		1.00
10-27-95 11-15-95	42,700 48,500			33,710			3,410		1.02
11-13-95	22,400			5,038					1.00
12-19-95	80,700			22,771	1,070				1.04
01-15-96	35,200			11,239					1.00
01-24-96	50,300			21,140					1.00
02-07-96	39,900			40,929			3,260	6.50	1.00
02-21-96	51,800			34,066			3,840	6.50	1.01
06-19-96	109,400			49,715					1
06-27-96	62,100					8,250			1
07-10-96	77,200			24,258	1,450	8,930	5,070	+	1
07-30-96	81,900			31,960		7,020	1,770	6.7	1.02
8/7/96	74,300		55,259	16,153	906				1.01
8/28/96	59,400	44,200	58,049	22,319	811	6,170	3,140	7	
9/5/96	79,600			25,354		8,290	4,550		1.00
9/19/96	92,600			27,124			4,970		1.02
10/9/96	54,000			26,426	+	6,890	3,980		1.01
10-29-96	48,200			11,480					1.01
11-15-96	34,900	20,000	43,133	6,845	632	5,850	3,490	6.51	1.03

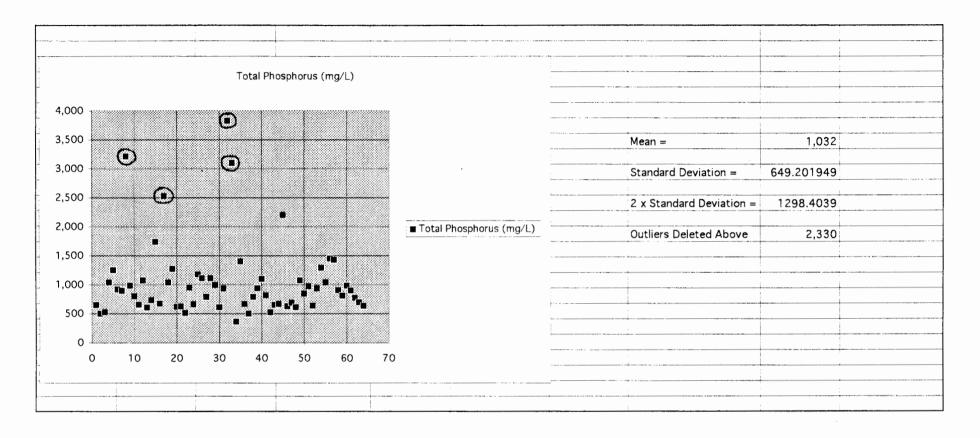


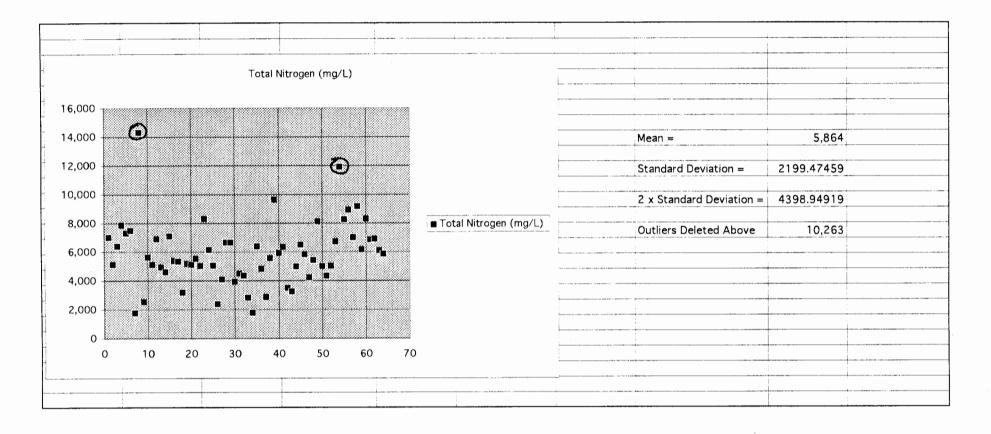


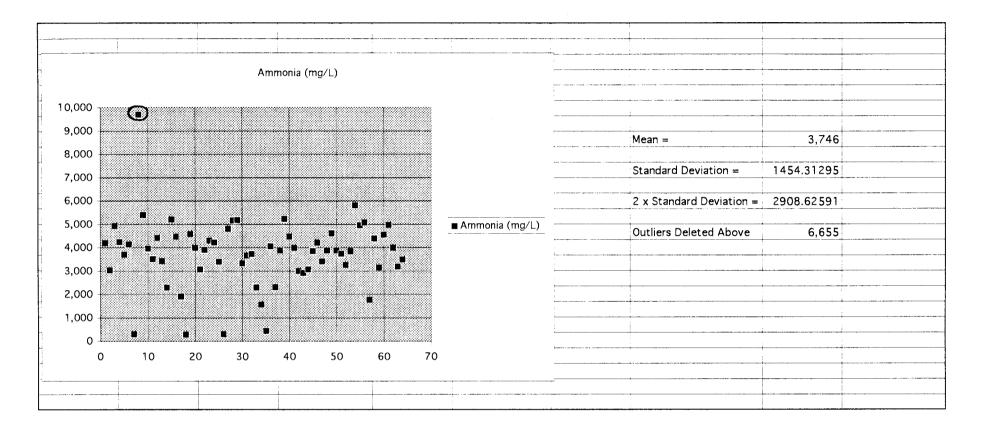


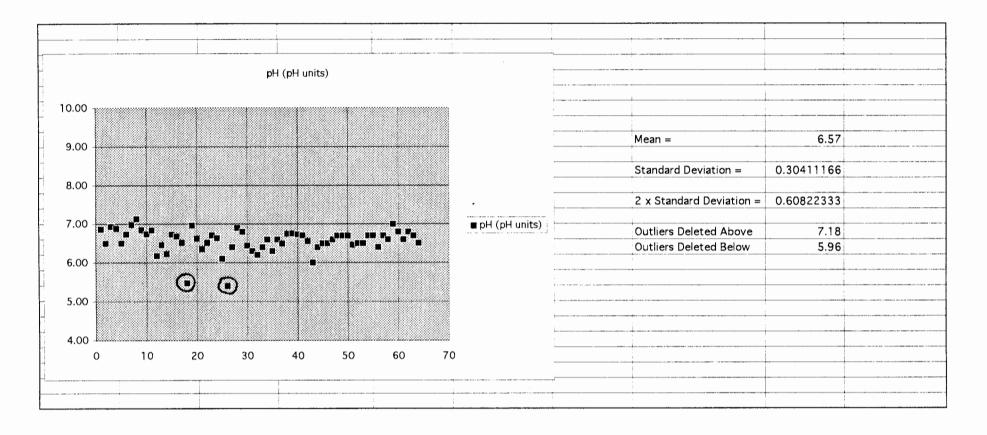
SK Onshore/Stats&Plots.9/23/97

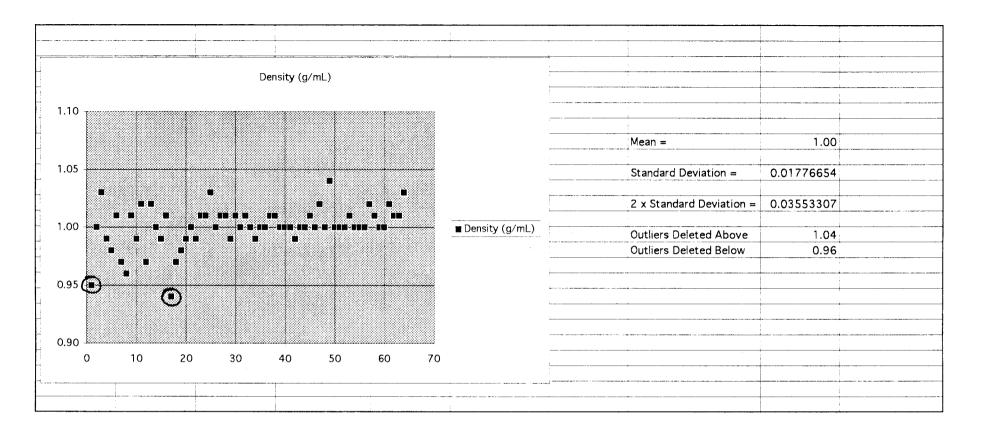














Column A	OR NEW PERMIT LIMITS Column B	Column C	Column D	Column E	Column F	Column G
column A	Untransformed	Transformed	Untransformed Mean	Transformed Mean	Coldinii	Condition
Sample Number	Total Solids	Total Solids	Minus Untransformed	Minus Transformed	Column D	Column E
y	(mg/L)	(mg/L)	Total Solids Value	Total Solids Value	Squared	Squared
1	17,300	9.75846178	2091.147541	0.010281173	4372898.038	0.000105703
2	6,790	8.823206221	12601.14754	0.945536733	158788919.3	0.894039713
3	8,480	9.045465729	10911.14754	0.723277224	119053140.7	0.523129943
4	19,200	9.862665558	191.147541	-0.093922605	36537.38242	0.008821456
5	27,500	10.22194128	-8108.852459	-0.45319833	65753488.2	0.205388727
6	·	9.775654181	1791.147541	-0.006911228	3208209.514	4.77651E-05
7	12,100	9.400960732	7291.147541	0.367782222	53160832.46	0.135263763
	· · · · · · · · · · · · · · · · · · ·	10.41030515	-13808.85246	-0.641562202	190684406.2	0.411602059
9	 	9.655026193	3791.147541	0.11371676	14372799.68	0.012931502 0.665658235
10	·	8.952864142	11661.14754	0.815878812 0.069822566	135982362 9555193.12	0.004875191
11	16,300	9.698920387 9.581903928	3091.147541 4891.147541	0.186839025	23923324.27	0.034908821
12		9.384293679	7491.147541	0.384449274	56117291.48	0.147801244
14		9.200290036	9491.147541	0.568452917	90081881.64	0.323138719
15		9.392661929	7391.147541	0.376081025	54629061.97	0.141436937
16		9.449357272	6691.147541	0.319385681	44771455.42	0.102007213
17	5,390	8.592300664	14001.14754	1.176442289	196032132.5	1.38401646
18		9.143131622	10041.14754	0.625611331	100824643.9	0.391389537
19	4	10.41930072	-14108.85246	-0.650557765	199059717.7	0.423225405
20		10.7342204	-26508.85246	-0.965477443	702719258.7	0.932146692
21	22,000	9.998797732	-2608.852459	-0.230054779	6806111.153	0.052925201
22	•	9.836278803	691.147541	-0.06753585	477684.9234	0.004561091
23		10.72106231	-25908.85246	-0.952319358	671268635.7	0.90691216
24	<u> </u>	9.692766521	3191.147541	0.075976432	10183422.63	0.005772418
25	•	10.16585182	-6608.852459	-0.397108864	43676930.83	0.15769545
26	22,600	10.02570519	-3208.852459	-0.256962232	10296734.1	0.066029589
27	24,600	10.11050172	-5208.852459	-0.341758769	27132143.94	0.116799056
28	20,700	9.937888979	-1308.852459	-0.169146026	1713094.759	0.028610378
29	18,400	9.820105944	991.147541	-0.05136299	982373.448	0.002638157
30	22,600	10.02570519	-3208.852459	-0.256962232	10296734.1	0.066029589
31	10,000	9.210340372	9391.147541	0.558402581	88193652.14	0.311813443
32	12,300	9.417354541	7091.147541	0.351388412	50284373.45	0.123473816
33	13,700	9.525151112	5691.147541	0.243591841	32389160.33	*····
34	12,600	9.441452093	6791.147541	0.32729086	46119684.92	0.107119307
35	16,900	9.735068901	2491.147541	0.033674052	6205816.071	0.001133942
36	16,700	9.723163998	2691.147541	0.045578955	7242275.087	0.002077441
37	19,300	9.867860375	91.14754098	-0.099117422	8307.874227	0.009824263
38	24,000	10.08580911	-4608.852459	-0.317066156	21241520.99	
39	15,700	9.661415991	3691.147541	0.107326962	13624570.17	0.011519077
40		9.686574551	3291.147541	0.082168402	10831652.14	
41	4 · · · · · · · · · · · · · · · · · · ·	9.661415991	3691.147541	0.107326962	13624570.17	+
42	· · · · · · · · · · · · · · · · · · ·	9.661415991	3691.147541	0.107326962	13624570.17	+
43		9.655026193	3791.147541	0.11371676	14372799.68	
44			2391.147541	0.02777433	5717586.563	
45		· · · · · · · · · · · · · · · · · · ·	4691.147541	0.173140181	22006865.25	
46		9.26860928		0.500133673	77284275.09	
47	37,000		-17608.85246	+		0.56239536
48		10.4744671	-16008.85246	-0.705724146 0.173140181	256283357.1 22006865.25	0.49804657
49		9.595602773	4691.147541	·		
50		9.836278803	691.147541	-0.06753585	477684.9234 7790504.596	
51				0.051584979 -0.04043392		
52					9664963.612	
53				0.280770845	38330307.87	
54				0.584746557	93144648.86	+
55		1				-
56 57	*		-15708.85246			
58				+·		
59		•	4	 		0.458422282
60						
61				·		
01	1,182,860			T		
Column Sum	19391.14754				5123045220	12.700369
Column Sum/N	1					
Column Sum/(N-	1)		1		85384086.99	0.21167281
SQRT(Column Su					9240.351021	·
G.: 7-4:-	, <u> </u>		1			L
				I	Transformed convert	ed
	1		Untransformed	Transformed	to Untransformed	
	1	Mean	19391.14754			
		Std Dev	9240.351021	1		
		Permit Limit	37548.4373	†		

olumn A	OR NEW PERMIT LIMITS Column B	Column C	Column D	Column E	Column F	Column G
		Transformed		Transformed Mean		
ample Number	Total Vol. Solids	Total Vol. Solids	Minus Untransformed		Column D	Column E
	(mg/L)	(mg/L)	Total Vol. Solids Valu			Squared
1	9,920	9.2023082	1305.032787	-0.130220301	1703110.575	0.01695732
2	897	6.799055862	10328.03279	2.273032038	106668261.2	5.16667464
2	3,390	8.1285852	7835.032787	0.943502699	61387738.77	0.89019734
		9.134538659	1955.032787	-0.062450759	3822153.198	
	9,270			the second secon	7155449.591	0.21860881
5	13,900	9.539644119	-2674.967213	-0.467556219	C. AMPAGA CAPAGA CAMADA CANADA	
6	8,890	9.092682329	2335.032787	-0.020594429	5452378.116	
7	6,270	8.743531634	4955.032787	0.328556266	24552349.92	
8	25,000	10.1266311	-13774.96721	-1.054543204	189749721.7	1.11206130
9	7,170	8.877660934	4055.032787	0.194426966	16443290.9	
10	2,440	7.799753318	8785.032787	1.272334581	77176801.07	
11	8,430	9.039552051	2795.032787	0.032535849	7812208.28	
12	7,050	8.860782896	4175.032787	0.211305004	17430898.77	0.0446498
13	5,090	8.53503311	• 6135.032787	0.53705479	37638627.3	0.2884278
14	2,870	7.962067309	8355.032787	1.110020591	69806572.87	1.2321457
15	5,820	8.669055541	5405.032787	0.403032359	29214379.43	0.1624350
16	5,980	8.696175847	5245,032787	0.375912053	27510368.94	0.1413098
17	1,430	7.265429723	9795.032787	1.806658176	95942667.3	
18	5,940	8.689464412	5285.032787	0.382623487	27931571.56	
19	27,000	10.20359214	-15774.96721	-1.131504245	248849590.6	right at the commencement and the commencement are a second as a second and a second are a second as a second as a second are a second as
20	38,400	10.55581274	-27174.96721	-1.483724839	738478843	
+	the second of th	9.705036614	-5174.967213	-0.632948714	26780285.66	
21	16,400	THE RESERVE THE PARTY OF THE PA		-0.205911121	275659.4273	
22	10,700	9.27799902	525		the same and the same of the s	
23	35,300	10.47163824	-24,075	-1.399550343	579604046.3	
24	8,300	9.024010794	2,925		8555816.804	
25	20,000	9.903487553	-8,775	-0.831399653	77000049.59	
26	10,300	9.239899174		-0.167811274	855685.6568	
27	15,400	9.642122788	-4,175	-0.570034889	17430351.23	
28	11,000	9.305650552	225	-0.233562652	50639.75517	
29	8,850	9.088172738	2,375	-0.016084838	5640780.739	0.0002587
30	13,000	9.472704636	-1,775	-0.400616737	3150508.608	0.160493
31	3,190	8.067776196	8,035	1.004311704	64561751.89	1.0086419
32	3,420	8.13739583		0.93469207	60918536.8	0.8736492
33	5,730	8.65347081	5,495	0.41861709	30195385.33	
34	2,170	7.682482447	9,055	1.389605453	81993618.77	+
35	7,200	8.881836305			16200888.94	
		8.921324077		0.150763823	13950469.92	
36	7,490		-975	A contract of the contract of	950561.0666	
37	12,200	9.409191231			23765305.33	
38	16,100	9.686574551	-4,875			
39	9,500	9.159047078		-0.086959178	2975738.116	
40	8,690	9.069928218			6426391.231	4
41	7,460	8.917310693			14175471.89	
42	7,280	8.892886141	3,945		15563283.69	
43	7,260	8.890135108	3,965	0.181952792	15721485	
44	7,510	8.923990745	3,715	0.148097155	13801468.61	0.0219327
45	6,640	8.800867242	4,585	0.271220657	21022525.66	0.0735606
46	3,860	8.258422462			54243707.95	0.6620514
47	27,900	10.23638197	-16,675	where the same of the contract of the same of the contract of	278054531.6	The second secon
48	25,200	10.13459927	-13,975		195299708.6	
49	7,540	8.927977461	3,685		13579466.64	<u> </u>
	2 - 2 -		the second secon	0.11205070	2146321.067	and the second s
50	9,760	9.186047679	•			† · ·
51	7,860	8.969541885				
52	11,900	9.384293679		•	455580.7388	rafe in the comment of the comment of the comment of the comment of the comment of the comment of the comment
53	13,400	9.503009986	· · · · · · · · · · · · · · · · · · ·		4730482.378	
54	6,130	8.720950029	A COMPANY OF THE PARTY OF THE P		25959359.1	
55	4,530	8.418477218			44823464.02	
56	10,400	9.249561085			680679.0994	
57	23,900	10.08163374	-12,675	-1.009545838	160654793.9	
58	10,400	9.249561085	825	-0.177473185	680679.0994	0.0314967
59	22,700				131674872.5	0.9178258
60	26,300	10.17732422			227254636.5	
61	16,700	9.723163998			29975265.98	
olumn Sum	684,727	553.3973619		1	4077830684	
		9.0720879				5555100
olumn Sum/N	11,225	9.0120819			67963844.73	0.566669
olumn Sum/(N-						The second secon
RT(Column Su	m/(N-1))				8244.018725	0.752774
						l
					Transformed conve	rted
			Untransformed	Transformed	to Untransformed	
		Mean	11,225		8708.787913	
		Std Dev	8244.018725		2.122882116	4
		Permit Limit	27424.52958		38226.72264	
		. C. HOY LUMB	2,727,32330	10.0012301	55220.1220	1
					i	1

A LUMB A	Column B	Column C	Column D	Calumn E	Column F	Column G
	Column B		Column D	Column E	Column	Columnio
	Untransformed	Transformed	Untransformed Mean	Transformed Mean	C. I	C
ample Number	5-Day BOD	5-Day BOD	Minus Untransformed	a series of the second commence to the		Column E
	(mg/L)	(mg/L)	5-Day BOD Value	5-Day BOD Value	Squared	Squared
1	33,500	10.41930072	-7254.098361	-0.341824912	52621943.03	0.11684427
2	30,700	10.33201793	-4454.098361	-0.254542128	19838992.21	0.06479169
3	32,000	10.37349118	-5754.098361	-0.296015376	33109647.94	0.08762510
4	27,100	10.20728901	-854.0983607	-0.129813201	729484.0097	0.01685146
5	13,800	9.532423871	12445.90164	0.545051934	154900467.6	0.29708161
6	21,000	9.952277717	5245.901639	0.125198089	27519484.01	0.01567456
7	24,400	10.10233841	1845.901639	-0.024862606	3407352.862	0.00061814
8	13,200	9.487972109	13045.90164		170195549.6	0.34751460
9	24,100	10.08996712	2145.901639		4604893.846	0.00015603
10	18,000	9.798127037		0.279348769	67994893.85	0.07803573
			8245.901639	0.179000795		0.0320412
11	19,900	9.898475011	6345.901639		40270467.62	
12	20,100	9.908475094	6145.901639		37772106.96	0.0285612
13	18,900	9.846917201	7345.901639		53962270.89	0.053157
14	19,300	9.867860375	6945.901639		48245549.58	0.0439386
15	11,300	9.332558005	14945.90164	0.744917801	223379975.8	0.554902
16	14,400	9.574983486	11845.90164	0.50249232	140325385.6	0.2524985
17	22,500	10.02127059	3745.901639	0.056205217	14031779.09	0.0031590
18	54,500	10.90595598	-28254.09836	-0.828480175	798294074.2	0.6863794
19	73,200	11.2009507	-46954.09836	-1.123474894	2204687353	1.2621958
20	26,400	10.18111929	-154.0983607	-0.103643484	23746.30476	0.0107419
21	57,800	10.96474405	-31554.09836	-0.887268249	995661123.4	0.7872449
22	99,800	11.51092346	-73554.09836	-1.433447657	5410205386	2.0547721
23	21,600	9.980448594	4645.901639	0.097027212	21584402.04	0.009414
24	23,300	10.05620864	2945.901639		8678336.469	0.0004522
25	24,200	10.09410791	2045.901639		4185713.518	0.0002766
26	20,700	9.937888979	5545.901639		30757024.99	0.0194844
27	16,000	9.680344001	10245.90164	de maria de como en la compania del la compania de la compania de la compania del la compania de la compania de la compania de la compania de la compania de la compania de la compania del la compania de la compania de la compania del la compania de la compania de la compania del la compania d	104978500.4	0.157713
28	15,600	9.655026193	10645.90164	0.422449612	113335221.7	0.1784636
29	32,400	10.3859137	-6154.098361	-0.308437896	37872926.63	0.0951339
30	16,500	9.71111566	9745.901639	0.366360146	94982598.76	0.1342197
31	20,300	9.918376165	5945.901639	0.159099641	35353746.3	0.0253126
32	18,600	9.83091686	7645.901639	0.246558946	58459811.88	0.0607913
33	21,000	9.952277717	5245.901639	0.125198089	27519484.01	0.0156745
34	39,100	10.57387775	-12854.09836	-0.49640194	165227844.7	0.2464148
35		9.975808214	4745.901639	0.101667591	22523582.37	0.0103362
	21,500					
36	26,600	10.18866649	-354.0983607	-0.111190689	125385.649	0.01236336
37	36,200	10.4968144	-9954.098361	-0.419338592	99084074.17	0.1758448
38	22,900	10.03889219	3345.901639	0.038583616	11195057.78	0.00148869
39	29,100	10.27849345	-2854.098361	-0.201017648	8145877.452	0.0404080
40	27,400	10.21829829	-1154.098361	-0.140822487	1331943.026	0.0198309
41	19,400	9.873028345	6845.901639	0.204447461	46866369.26	0.0417987
42	18,000	9.798127037	8245.901639	0.279348769	67994893.85	0.0780357
43	20,500	9.928180165	5745.901639		33015385.65	0.0222891
44	18,700	9.836278803	7545.901639	0.241197003	56940631.55	0.0581759
45	18,900	9.846917201	7345.901639	0.230558605	53962270.89	0.053157
46	43,500	10.68051622	-17254.09836	-0.603040412	297703910.2	0.3636577
47	32,000	10.37349118	-5754.098361	-0.296015376	33109647.94	0.0876251
48	29,200	10.28192399	-2954.098361	-0.204448183	8726697.124	0.0417990
49	24,600	10.11050172	1645.901639	-0.033025916	2708992.206	0.0010907
50	23,900	10.08163374	2345.901639	-0.004157932	5503254.501	1.72884E-
51	41,300	10.62861778	-15054.09836	-0.551141973	226625877.5	0.3037574
52	23,100	10.0475879	3145.901639	0.029887909	9896697.124	0.0008932
53	27,000	10.20359214	-754.0983607	-0.126116339	568664.3375	0.0159053
54	14,200	9.560997244	12045.90164		145103746.3	0.2667501
55	12,500	9.433483923	13745.90164	0.643991882	188949811.9	0.4147255
56	21,700	9.98506754	4545.901639	0.092408266	20665221.71	0.0085392
57		10.29214554	-3254.098361	-0.214669737	10589156.14	0.0460830
	29,500					
58	18,400	9.820105944	7845.901639	0.257369862	61558172.53	0.0662392
59	19,400	9.873028345	6845.901639	0.204447461	46866369.26	0.0417987
60	21,000	9.952277717	5245.901639	0.125198089	27519484.01	0.0156745
61	15,300	9.635608107	10945.90164	0.441867698	119812762.7	0.1952470
lumn Sum	1,601,000	614.7260241			12811811475	10.121671
lumn Sum/N	26,246	10.07747581				
lumn Sum/(N-					213530191.3	0.1686945
RT(Column Sur					14612.67228	0.4107243
zici (Cordinii Sur					,7012,01220	0.7101243
					Transformed conver	ted
			Untransformed	Transformed	to Untransformed	
		Mean	26,246	10.07747581	23800.83173	
		Std Dev	14612.67228	0.410724384	1.507909695	
		Permit Limit	54959.80268	10.88454922	53345.73018	

	FOR NEW PERMIT LIMITS Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean	,	
Sample Number	Oil & Grease	Oil & Grease	Minus Untransformed			Column E
	(mg/L)	(mg/L)	Oil & Grease Value	Oil & Grease Value		Squared
	20,588 33,370	9.932463661 10.41541257	3625.344262 -9156.655738	-0.498266278 -0.981215189	13143121.02 83844344.3	0.24826928- 0.96278324
3	5,680	8.644706512	18533.34426	0.789490871	343484849.5	0.62329583
4	16,700	9.723163998	7513.344262	-0.288966616	56450342	0.08350170
5	8,520	9.05017162	15693.34426	0.384025763	246281054.1	0.14747578
6	14,580	9.587406006	9633.344262	-0.153208623	92801321.68	0.02347288
7	4,006	8.295548516	20207.34426	1.138648867	408336762.1	1.29652124
8	5,240	8.564076777	18973.34426	0.870120606	359987792.5	
9		7.807916629	21753.34426	1.626280754	473207986.6	
10		9.234056899	13973.34426	0.200140484 0.546820897	195254349.9	
12	7,240 3,700	8.887376485 8.216088099	16973.34426 20513.34426	1.218109284	288094415.4 420797292.8	
13		7.579678823	22255.34426	1.85451856	495300348.2	
14		9.766521697	6773.344262	-0.332324315	45878192.5	
15		9.854297308	5173.344262	-0.420099925	26763490.86	0.17648394
16	16,200	9.692766521	8013.344262	-0.258569138	64213686.27	0.06685799
17		9.188094763	14433.34426	0.24610262	208321426.6	
18		9.091556836	15333.34426	0.342640547	235111446.3	
19	28,120		-3906.655738	-0.810038963	15261959.05	
20	37,900	10.54270639	-13686.65574	-1.108509008 0.550695799	187324545.3 289045706.7	1.22879222 0.30326586
21	7,212 28,840	8.883501584 10.26951859	17001.34426 -4626.655738	-0.835321209	21405943.32	
23	5,788	8.663542088	18425.34426	0.770655295	339493311.2	
24		10.95535758	-33046.65574	-1.521160196	1092081455	
25		10.5363538	-13446.65574	-1.102156419	180812550.5	
26	19,460	9.876116356	4753.344262	-0.441918973	22594281.68	0.19529237
27	15,940	9.676586952	8273.344262	-0.242389569	68448225.28	
28	160,000	11.98292909	-135786.6557	-2.548731711	18438015876	
29	919	6.823286122	23294.34426	2.610911261	542626474.6	
30	and the same for each or	7.489412084	22424.34426	1.944785299	502851215.6 117795081.7	
31	13,360 1,161	9.500020447 7.057036982	10853.34426 23052.34426	-0.065823064 2.377160401	531410576	
33	62,820	11.04802877	-38606.65574	-1.61383139	1490473867	
34	62,000	11.03488966	-37786.65574	-1.600692281	1427831352	
35	68,020	11.12755706	-43806.65574	-1.693359676	1919023087	*· · · · · · · · · · · · · · · · · · ·
36	49,140	10.80242865	-24926.65574	-1.368231263	621338166.3	1.8720567
37	10,460	9.255313738	13753.34426	0.178883645	189154478.4	0.03199935
38	7,600	8.935903526	16613.34426	0.498293857	276003207.6	
39	9,360	9.144200569	14853.34426	0.289996813	220621835.8	
40	7,600	8.935903526	16613.34426	0.498293857	276003207.6	
41 42	11,440 2,240	9.344871265 7.714231145	12773.34426 21973.34426	0.089326118 1.719966238	163158323.6 482827858.1	0.00797915 2.9582838
43	14,780	9.601030195	9433.344262	-0.166832812	88987983.97	
44		9.653743319	8633.344262	-0.219545937	74534633.15	+
45	78,640	11.27263575	-54426.65574	-1.838438372	2962260855	 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
46	10,120	9.222268943	14093.34426	0.21192844	198622352.5	0.044913664
47	23,800	10.07744086	413.3442623	-0.643243477	170853.4792	0.4137621
48	20,500	9.928180165	3713.344262	-0.493982782	13788925.61	0.24401898
49	24,600	10.11050172	-386.6557377	-0.676304339	149502.6595	<u> </u>
50	59,920		-35706.65574	-1.566568235	1274965264	
51			-90846.65574	-2.219011628	8253114859	
52			11745.34426	0.003276742 -2.054025469	137953111.8 5379731908	
53 54		11.48822285 8.628734566	-73346.65574 18623.34426	0.805462817	346828951.5	
55			-37986.65574	-1.603912896	1442986014	
56			20453.34426	1.202023146	418339291.5	
57			19013.34426	0.877783478	361507260	
58			20353.34426	1.17577492	414258622.7	
59			17833.34426	0.673274007	318028167.6	
60		8.383661799	19838.34426	1.050535584	393559903.1	
61	910		23303.34426	2.620752783	543045853.8	
Column Sum	1,477,014	575.4860404			56095709122	87.5366697
Column Sum/N	24,213	9.434197383			03 4000 405 4	1.45004110
Column Sum/(N-					934928485.4	*
SQRT(Column Su	my (N-1))				30576.60029	1.20786774
					Transformed conver	
			Untransformed	Transformed	to Untransformed	
		Mean	24,213	9.434197383		
		Std Dev	30576.60029	1.207867747	3.346341794	
		Permit Limit	84296.36383	11.80765751	134276.6505	
		Table 3-2 Constant = 1	065			

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	OR NEW PERMIT LIMITS COlumn B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Total Phos	Total Phos	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	Total Phos Value	Total Phos Value	Squared	Squared
	750	6.620073207	410.359375	0.310354791	168394.8167	0.09632009
2	1,400	7.244227516	-239.640625	-0.313799518	57427.62915	0.09847013
3	2,400	7.783224016	-1239.640625	-0.852796018	1536708.879	0.72726104
4	2,100	7.649692624	-939.640625	-0.719264626	882924.5042	
5	2,200		-1039.640625	-0.765784641	1080852.629	0.58642611 0.28462048
6	600	6.396929655	560.359375 -39.640625	0.533498343 -0.159648838	314002.6292 1571.37915	0.02548775
	1,200 1,000	7.090076836 6.907755279	160.359375	0.022672719	25715.12915	0.00051405
9	1,200		-39.640625	-0.159648838	1571.37915	0.02548775
10	1,000	6.907755279	160.359375	0.022672719	25715.12915	0.00051405
11	1,000	6.907755279	160.359375	0.022672719	25715.12915	0.00051405
12	600	6.396929655	560.359375	0.533498343	314002.6292	0.28462048
13	800	6.684611728	360.359375	0.24581627	129858.8792	0.06042563
14	1,900	7.549609165	-739.640625	-0.619181167	547068.2542	0.38338531
15	2,000	7.60090246	-839.640625	-0.670474462	704996.3792	0.44953600
16	1,200	7.090076836	-39.640625	-0.159648838	1571.37915	0.02548775
17	1,200	7.090076836	-39.640625	-0.159648838	1571.37915	0.02548775
18	1,000	6.907755279	160.359375	0.022672719	25715.12915	0.00051405
19	1,000	6.907755279	160.359375	0.022672719	25715.12915	0.00051405
20	1,000	6.907755279	160.359375	0.022672719	25715.12915	0.00051405
21	700		460.359375	0.379347663	211930.7542	0.14390464
22	1,200		-39.640625	-0.159648838	1571.37915	0.02548775
23	1,000		160.359375	0.022672719	25715.12915	0.00051405
24	2,400		-1239.640625	-0.852796018	1536708.879	0.72726104
25	1,200		-39.640625 -39.640625	-0.159648838 -0.159648838	1571.37915 1571.37915	0.02548775
26	1,200		-39.640625	-0.159648838	1571.37915	0.02548775
27 28	1,200		-539.640625		291212.0042	
29	1,200	7.090076836	-39.640625	-0.159648838	1571.37915	0.02548775
30	2,000	*****	-839.640625	-0.670474462	704996.3792	0.44953600
31	1,500		-339.640625	-0.382792389	115355.7542	0.14653001
32	2,000		-839.640625	-0.670474462	704996.3792	0.44953600
33	1,000		160.359375	0.022672719	25715.12915	0.00051405
34	1,300		-139.640625	-0.239691546	19499.50415	0.05745203
35	1,700	<u> </u>	-539.640625	-0.507955532	291212.0042	0.25801882
36	1,200		-39.640625	-0.159648838	1571.37915	0.02548775
37	1,200		-39.640625	-0.159648838	1571.37915	0.02548775
38	2,000		-839.640625	-0.670474462	704996.3792	0.44953600
39	1,200	7.090076836	-39.640625	-0.15 964 8838	1571.37915	0.02548775
40	1,800	7.495541944	-639.640625	-0.565113946	409140.1292	
41	1,300	7.170119543	-139.640625	-0.239691546	19499.50415	
42	1,000	6.907755279	160.359375	0.022672719	25715.12915	4
43	700		460.359375	0.379347663	211930.7542	4
44	1,200		-39.640625	-0.159648838	1571.37915	
45	287	5.659482216	873.359375	1.270945782	762756.5979	
46	310		850.359375	1.1938557	723111.0667	· · · · · · · · · · · · · · · · · · ·
47	333	 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	827.359375	1.122285508	684523.5354	+
48	507	6.228511004	653.359375	0.701916994	426878.4729	-
49	780	· · · · · · · · · · · · · · · · · · ·	380.359375	0.271134078	144673.2542 134952.9104	†
50	793		367.359375 792.359375	· · · · · · · · · · · · · · · · · · ·	627833.3792	
51	368		† · · · · · · · · · · · · · · · · · · ·		10273.7229	+
53	1,059 655		·		255388.0979	1
54	616	•	544.359375	0.507181034	296327.1292	
55 56	1,287			*	16037.8479	
57	984		176.359375	+ · · · · · · · · · · · · · · · · · · ·	31102.62915	
58	818		342.359375		117209.9417	
59	371	5.916202063	 		623088.2229	
60	736		+			† ··· · · · · · · · · · · · · · · · · ·
61	404	+ · · · · · · · · · · · · · · · ·			+	d
62	2,156			d	991300.2542	0.5558924
63	2,163			-0.748823428		4
64	427		733.359375	0.873643985		
65	759	6.632001777	401.359375	0.29842622	161089.3479	
Column Sum	74,263			ļ	19511390.73	17.791630
Column Sum/N	1,160	6.930427998	i	ļ ·		
Column Sum/(N-1			ļ		304865.4802	
SQRT(Column Sun	n/(N-1))				552.1462489	0.5272515
		<u></u>			T	
					Transformed conver	tea
			Untransformed	Transformed	to Untransformed	ļ
		T				
		Mean	1,160		1022.931699	
		Mean Std Dev Permit Limit	1,160 552.1462489 2245.326754	0.527251575	1.694269331	

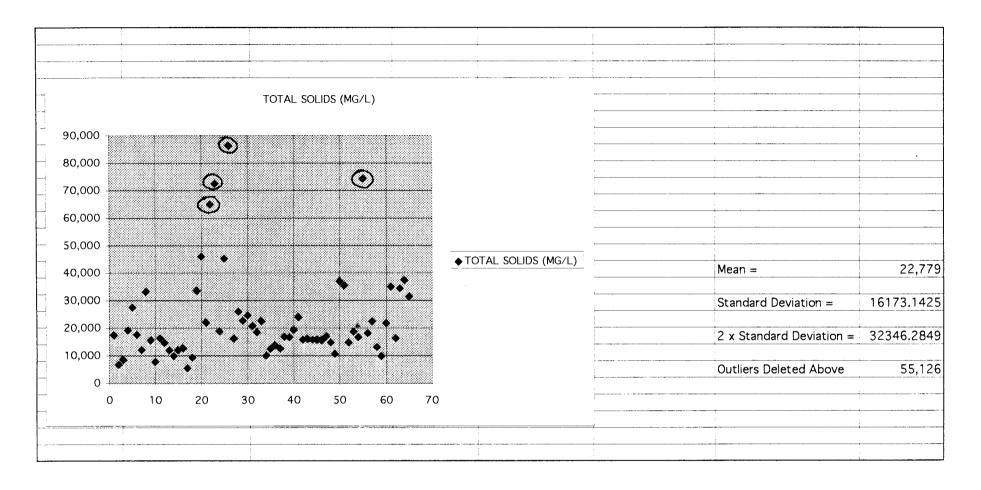
	OR NEW PERMIT LIMITS Column B	Column C	Column D	Column E	Column F	Column G	
	Untransformed	Transformed	Untransformed Mean	Transformed Mean			
Sample Number	Total Nitrogen	Total Nitrogen	Minus Untransformed	Minus Transformed	Column D	Column E	
	(mg/L)	(mg/L)	Total Nitrogen Value	Total Nitrogen Value		Squared	0.405.440005
1	2,940	7.98616486	3073.206349		9444597.265		0.435442025
3	3,080 5,880	8.032684876 8.679312041	2933.206349 133.2063492	0.613360295 -0.03326687	8603699.487 17743.93147		0.001106685
4	6,160	8.725832057	-146.7936508	-0.079786885	21548.37591	 	0.006365947
5	7,840	8.966994113	-1826.793651	-0.320948942	3337175.043	İ	0.103008223
6	4,480	8.407378325	1533.206349	0.238666846	2350721.709		0.056961863
7	8,120	9.002085433	-2106.793651	-0.356040262	4438579.487		0.126764668
В	5,880	8.679312041	133.2063492	-0.03326687	17743.93147	·	0.001106685
9	5,880	8.679312041	133.2063492	-0.03326687	17743.93147		0.001106685
10	the second contract of the second contract of	8.679312041	133.2063492	-0.03326687	17743.93147		0.001106685
11	4,760	8.468002947	1253.206349 -1266.793651	0.178042224 -0.24684097	1570526.154 1604766.154		0.031699034
12	7,280 6,160	8.892886141 8.725832057	-146.7936508	-0.079786885	21548.37591		0.006365947
14	5,880	8.679312041	133.2063492	-0.03326687	17743.93147		0.001106685
15	7,280	8.892886141	-1266.793651	-0.24684097	1604766.154	1	0.060930464
16		7.580699752	4053.206349	1.065345419	16428481.71		1.134960862
17	4,760	8.468002947	1253.206349	0.178042224	1570526.154		0.031699034
18		8.407378325	1533.206349	0.238666846	2350721.709	+	0.056961863
19		8.930626469	-1546.793651	-0.284581298	2392570.598		0.080986515
20		7.937374696	3213.206349	0.708670475	10324695.04		0.502213842
21	4,480		1533.206349	0.238666846 0.613360295	2350721.709 8603699.487		0.056961863
22 23	3,080 7,560	8.032684876 8.930626469	2933.206349 -1546.793651	-0.284581298			0.080986515
24	3,920	8.273846933	2,093	0.372198238		+	0.138531529
25	4,480		1533.206349	+	+ · · · · · · · · · · · · · · · ·		0.056961863
26	8,960	9.100525506	-2946.793651	-0.454480335	8683592.82		0.206552375
27	6,160	8.725832057	-146.7936508	-0.079786885	21548.37591		0.006365947
28	7,280	8.892886141	-1266.793651	-0.24684097	1604766.154	+	0.060930464
29	7,560	8.930626469	-1546.793651	-0.284581298			0.080986515
30	5,320	8.579228582	693.2063492		480535.0426 2392570.598		0.004464457
31 32	7,560 4,480	8.930626469 8.407378325	-1546.793651 1533.206349	-0.284581298 0.238666846	4		0.056961863
33	5,320	8.579228582	693.2063492	0.066816589			0.004464457
34	7,280	8.892886141	-1266.793651	-0.24684097	1604766.154		0.060930464
35	7,560	8.930626469	-1546.793651	-0.284581298	2392570.598		0.080986515
36	6,160	8.725832057	-146.7936508	-0.079786885	21548.37591		0.006365947
37	4,480	8.407378325	1533.206349		2350721.709		0.056961863
38	5,264	8.568646473	749.2063492			*	0.005990558
39	6,348	8.755895082	-334.7936508	+	112086.7886		0.012067003
40	5,040 7,840	8.525161361 8.966994113	973.2063492 -1826.793651	0.12088381 -0.320 94 8 94 2	947130.5981 3337175.043		0.103008223
42	7,840	8.966994113	-1826,793651	-0.320948942	3337175.043		0.103008223
43	4,760	8.468002947	1253.206349		1570526,154	•	0.031699034
44	•	8.725832057	-146.7936508		21548.37591	- · · · · · · · · · · · · · · · · · · ·	0.006365947
45	7,560	8.930626469	-1546.793651	-0.284581298	2392570.598		0.080986515
46	7,560		-1546.793651	-0.284581298			0.080986515
47	8,400	9.035986985	-2386.793651	-0.389941814			0.152054618
48	 I a a a a a a a a a a a a a a a a a a a		-2946.793651	-0.454480335			0.206552375
49			-2106.793651	-0.356040262	•		0.126764668
50		8.679312041	133.2063492		17743.93147 5696783.931		0.001106685
. 51	8,400	9.035986985	-2386.793651 -1266.793651		1604766.154		0.060930464
52 53			-1266.793651 -706.7936508			-	0.0278216
54	t			-0.454480335	8683592.82		0.206552375
55			133.2063492		17743.93147		0.00110668
56	*			0.066816589	480535.0426	3	0.00446445
57							0.00446445
58			· · · · · · · · · · · · · · · · · · ·		170739.487		0.00024097
59					8603699.487		0.37621085
	+		-5746.793651				0.52767737
61			2373.206349 2653.206349		5632108.376 703 9 503.931		0.19918923
62 63					*		0.37621085
Column Sum	378,832			3.0.0300233	225057012.3		7.63281547
Column Sum/N	6,013					I	
Column Sum/(N-					3629951.812	2	0.12310992
SQRT(Column Su					1905.243242	?	0.35087024
						Ι	
					Transformed conver	ted	
	ļ		Untransformed	Transformed	to Untransformed	,	
		Mean Std Dov	6,013		5687.608677 1.420303019		
		Std Dev Permit Limit	1905.243242 9757.00932	·			
		Treatme Linux	3131.00932	3.033303197	11333.3324		
		Table 3-2 Constant = 1.		+	+	+	

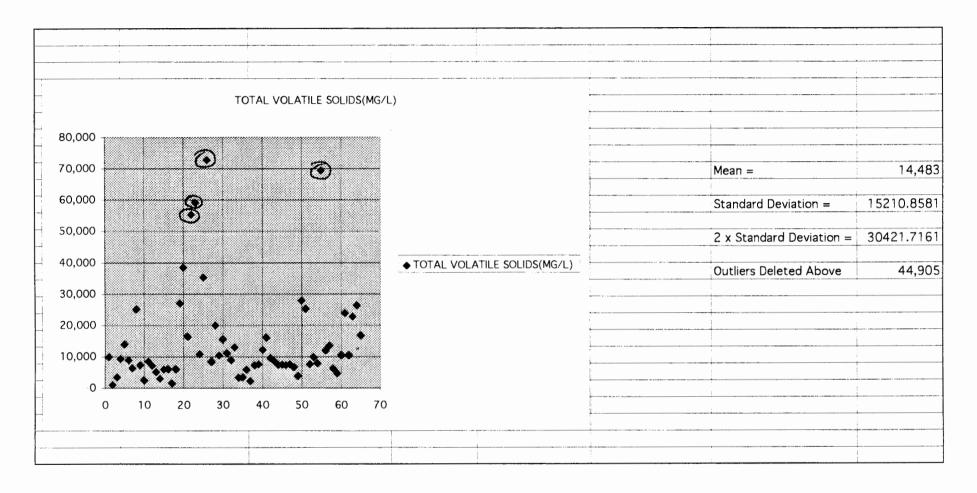
	OR NEW PERMIT LIMIT'S					
	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean	Caluma D	Column F
Sample Number	Ammonia	Ammonia	Minus Untransformed	Minus Transformed	Column D Squared	Column E Squared
	(mg/L) 560	(mg/L) 6.327936784	Ammonia Value 1876.349206	Ammonia Value 1.420116254	3520686.344	2.016730174
2	840	6.733401892	1596.349206	1.014651146	2548330.789	1.029516947
3	3,450	8.14612951	-1013.650794	-0.398076473	1027487.931	0.158464878
4	3,480	8.154787573	-1043.650794	-0.406734535	1089206.979	0.165432982
5	1,880	7.539027056	556.3492063	0.209025982	309524.4394	0.043691861
6	1,180	7.073269717	1256.349206	0.67478332	1578413.328	0.455332529
7	2,650	7.882314919	-213.6507937	-0.134261882	45646.66163	0.018026253
8	1,850	7.522940918	586.3492063	0.225112119	343805.3918	0.050675466
9	2,390	7.779048645	46.34920635	-0.030995608	2148.248929	0.000960728
10	2,000	7.60090246	436.3492063	0.147150578	190400.6299	0.021653293
11	2,290	7.736307097	146.3492063	0.011745941	21418.0902	0.000137967
12	2,500	7.824046011	-63.65079365	-0.075992973	4051.423532	0.005774932
13	2,050	7.625595072	386.3492063	0.122457965	149265.7092	0.014995953
14	2,300	7.740664402	136.3492063	0.007388635	18591.10607	5.45919E-05
15	1,960	7.580699752	476.3492063	0.167353285	226908.5664	0.028007122
16	1,590	7.371489295	846.3492063	0.376563742	716306.9791 165119.6775	0.141800252 0.017493227
17 18	2,030	7.615791072 7.718685495	406.3492063 186.3492063	0.132261965 0.029367542	34726.02671	0.000862453
19	2,250 1,220	7.106606138	1216.349206	0.6414469	1479505.392	0.411454125
20	1,440	7.106606138	996.3492063	0.475654645	992711.741	0.226247341
21	2,800	7.937374696	-363.6507937	-0.189321659	132241.8997	0.03584269
22	2,240	7.714231145	196.3492063	0.033821893	38553.01083	0.00114392
23	3,370	8.122668023	-933.6507937	-0.374614986	871703.8045	0.140336388
24	3,530	8.16905315	-1093.650794	-0.421000113	1196072.058	0.177241095
25	2,960	7.992944547	-523.6507937	-0.24489151	274210.1537	0.059971852
26	2,170	7.682482447	266.3492063	0.065570591	70941.89972	0.004299502
27	3,340	8.113726086	-903.6507937	-0.365673049	816584.7569	0.133716778
28	3,240	8.083328609	-803.6507937	-0.335275571	645854.5981	0.112409709
29	3,530	8.16905315	-1093.650794	-0.421000113	1196072.058	0.177241095
30	3,930	8.276394705	-1493.650794	-0.528341667	2230992.693	0.279144918
31	3,310	8.104703468	-873.6507937	-0.356650431	763265.7092	0.12719953
32	2,800	7.937374696	-363.6507937	-0.189321659	132241.8997	0.03584269
33	3,320	8.107720062	-883.6507937	-0.359667025	780838.7251	0.129360369
34	2,870	7.962067309	-433.6507937	-0.214014271	188053.0108	0.045802108
35	3,720	8.221478947	-1283.650794	-0.47342591	1647759.36	0.224132092
36	2,710	7.904703914	-273.6507937	-0.156650876	74884.75687	0.024539497
37	2,550	7.843848638	-113.6507937	-0.095795601	12916.5029	0.009176797
38	2,690	7.897296473	-253.6507937	-0.149243435	64338.72512	0.022273603
39	2,730	7.912056888	-293.6507937	-0.164003851	86230.78861	0.026897263
40	2,420	7.791522819	16.34920635	-0.043469782	267.2965482	0.001889622
41	2,340	7.757906208	96.34920635	-0.009853171	9283.169564	9.7085E-05
42	2,050	7.625595072	386.3492063	0.122457965	149265.7092	0.014995953
43	2,170	7.682482447	266.3492063	0.065570591	70941.89972	0.004299502
44	2,210	7.700747795	226.3492063	0.047305243	51233.96321	
45	2,400	7.783224016	36.34920635	-0.035170979	1321.264802	0.001236998
46	2,290	7.736307097	146.3492063	0.011745941	21418.0902	0.000137967
47 48	2,300	7.740664402 7.922985959	136.3492063 -323.6507937	0.007388635 -0.174932921	18591.10607 104749.8362	5.45919E-05 0.030601527
49	2,760 2,900	7.922985959	-463.6507937	-0.224412979	214972.0585	0.050361185
50	2,900	7.972466016	-433.6507937	-0.214014271	188053.0108	0.030361183
51	2,670	7.889833751	-233.6507937	-0.141780714	54592.69337	0.020101771
52	2,790	7.933796875	-353.6507937	-0.185743837	125068.8838	0.034500773
53	1,260	7.138867	1176.349206		1383797.455	0.371107628
54	2,150	7.673223121	286.3492063	0.074829916	81995.86798	0.005599516
55	3,080	8.032684876	-643.6507937	-0.284631839	414286.3442	0.081015284
56	1,930	7.565275282	506.3492063	0.182777755	256389.5188	0.033407708
57	1,730	7.455876687	706.3492063	0.29217635	498929.2013	0.085367019
58	2,440	·		-0.051700281	13.32829428	0.002672919
59	2,440	7.799753318	-3.650793651	-0.051700281	13.32829428	0.002672919
60	1,840	7.517520851	596.3492063	0.230532187	355632.3759	0.053145089
61	2,420	7.791522819	16.34920635	-0.043469782	267.2965482	0.001889622
62	2,260	7.723120092	176.3492063	0.024932945	31099.04258	0.000621652
63	2,050	7.625595072	386.3492063	0.122457965	149265.7092	0.014995953
Column Sum	153,490	488.1273414			29869460.32	7.432697151
Column Sum/N	2,436	7.748053037				
Column Sum/(N-1					481765.489	0.119882212
SQRT(Column Sur	m/(N-1))				694.0932855	0.346240108
					Transformed convert	ed
			Untransformed	Transformed	to Untransformed	
		Mean	2,436	7.748053037	2317.056797	
		Std Dev	694.0932855		1.413742025	
		Permit Limit	3800.242512	8.428414849	4575.241892	

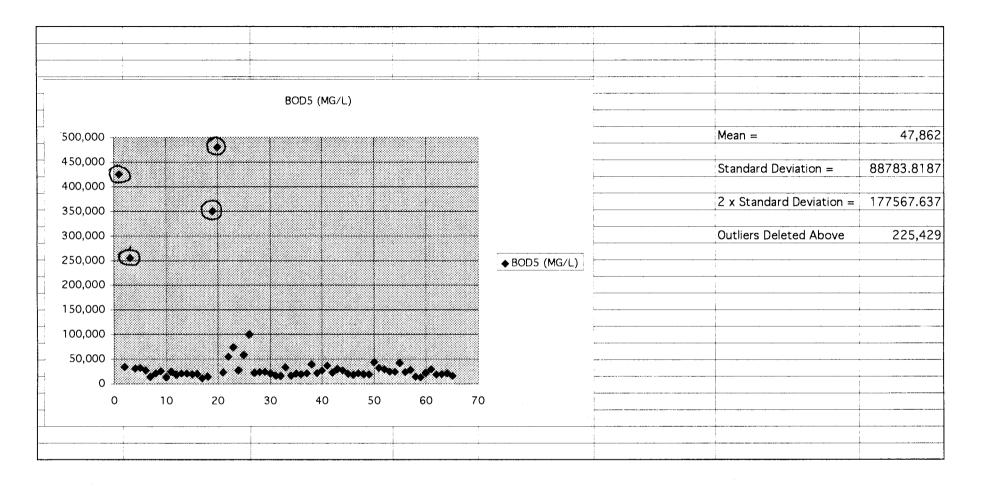
	OR NEW PERMIT LIMITS					
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	pH	рН	Minus Untransformed	Minus Transformed	Column D	Column E
	(pH Units)	(pH Units)	pH Value	pH Value	Squared	Squared
	6.65	1.894616855	-0.056333333	-0.010424592	0.003173444	0 000108672
	7.06	1.954445052	-0.4663333333	-0.070252789	0.217466778	0.004935454
3	6.61	1.888583654	-0.016333333	-0.004391391	0.000266778	1.92843E-05
	7.39 6.73	2.000127735 1.906575144	-0.796333333 -0.136333333	-0.115935472 -0.022382881	0.634146778 0.018586778	0.013441034 0.000500993
6	6.87	1.927164106	-0.276333333	-0.042971843	0.076360111	0.000300993
7	6.43	1.860974538	0.163666667	0.023217725	0.026786778	0.000539063
8	6.28	1.83736998	0.313666667	0.046822282	0.098386778	0.002192326
9	6.86	1.925707442	-0.266333333	-0.041515179	0.070933444	0.00172351
10	6.74	1.908059925	-0.146333333	-0.023867662	0.021413444	0.000569665
11	6.93	1.935859813	-0.336333333	-0.05166755	0.113120111	0.002669536
12	6.96	1.940179474	-0.366333333	-0.055987211	0.134200111	0.003134568
13	6.94	1.937301775	-0.346333333	-0.053109512	0.119946778	0.00282062
15	6.68 7.00	1.899117988 1.945910149	-0.086333333 -0.406333333	-0.014925725	0.007453444 0.165106778	0.000222777 0.003809097
16	6.72	1.905088155	-0.126333333	-0.061717886 -0.020895892	0.015960111	0.000436638
17	7.36	1.996059933	-0.766333333	-0.11186767	0.587266778	0.012514376
18	6.32	1.843719208	0.273666667	0.040473055	0.074893444	0.001638068
19	6.02	1.795087259	0.573666667	0.089105004	0.329093444	0.007939702
20	6.16	1.818076778	0.433666667	0.066115485	0.188066778	0.004371257
21	6.25	1.832581464	0.343666667	0.051610799	0.118106778	0.002663675
22	6.20	1.824549292	0.393666667	0.059642971	0.154973444	0.003557284
23	6.00	1.791759469	0.593666667	0.092432794	0.352440111	0.008543821
24	6.02	1.795087259	0.573666667	0.089105004	0.329093444	0.007939702
25 26	6.50	1.871802177 1.796747011	0.093666667 0.563666667	0.012390086 0.087445252	0.008773444 0.317720111	0.000153514 0.007646672
20	6.00	1.791759469	0.593666667	0.092432794	0.352440111	0.007548872
28	5.90	1.774952351	0.693666667	0.109239912	0.481173444	0.011933358
29	5.60	1.722766598	0.993666667	0.161425665	0.987373444	0.026058245
30	5.40	1.686398954	1.193666667	0.197793309	1.424840111	0.039122193
31	6.70	1.902107526	-0.106333333	-0.017915263	0.011306778	0.000320957
32	6.80	1.916922612		-0.032730349	0.042573444	0.001071276
33	6.70	1.902107526	-0.106333333	-0.017915263	0.011306778	0.000320957
34	6.50	1.871802177	0.093666667	0.012390086	0.008773444	0.000153514
35	6.00	1.791759469	0.593666667	0.092432794	0.352440111	0.008543821
36 37	6.80 6.60	1.916922612 1.887069649	-0.206333333 -0.006333333	-0.032730349 -0.002877386	0.042573444 4.01111E-05	0.001071276 8.27935E-06
38	6.80	1.916922612	-0.206333333	-0.032730349	0.042573444	0.001071276
39	6.60	1.887069649	-0.006333333	-0.002877386	4.01111E-05	8.27935E-06
40	6.90	1.931521412	-0.306333333	-0.047329149	0.093840111	0.002240048
41	7.10	1.960094784	-0.506333333	-0.075902521	0.256373444	0.005761193
42	6.60	1.887069649	-0.006333333	-0.002877386	4.01111E-05	8.27935E-06
43	6.80	1.916922612	-0.206333333	-0.032730349	0.042573444	0.001071276
44	6.60	1.887069649	-0.006333333	-0.002877386	4.01111E-05	8.27935E-06
45	6.70	1.902107526	-0.106333333	-0.017915263	0.011306778	0.000320957
46	7.00	1.945910149	-0.406333333	-0.061717886	0.165106778	0.003809097
47 48	6.20 6.60	1.824549292 1.887069649	0.393666667 -0.006333333	0.059642971 -0.002877386	0.154973444 4.01111E-05	0.003557284 8.27935E-06
49	6.50	1.871802177	0.093666667	0.012390086	0.008773444	0.000153514
50		1.902107526		-0.017915263	0.011306778	0.000133314
51	6.50	1.871802177	0.093666667	0.012390086	0.008773444	0.000153514
52	6.70	1.902107526	-0.106333333	-0.017915263	0.011306778	0.000320957
53	7.00	1.945910149	-0.406333333	-0.061717886	0.165106778	0.00380909
54	6.90	1.931521412	-0.306333333	-0.047329149	0.093840111	0.002240048
55	6.80	1.916922612	-0.206333333	-0.032730349	0.042573444	0.001071276
56	7.30	1.987874348	-0.706333333	-0.103682085	0.498906778	0.010749975
57	7.00	1.945910149	-0.406333333	-0.061717886	0.165106778	0.003809097
58	6.54	1.877937165	0.053666667	0.006255097	0.002880111	3.91262E-05
59 60	6.61	1.888583654	-0.0163333333	-0.004391391	0.000266778	1.92843E-05
Column Sum	6.46 395.62	1.865629318 113.0515358	0.133666667	0.018562945	0.017866778 9.692193333	0.000344583 0.233981264
Column Sum/N	6.59	1.884192263			5.U3E 133333	0.233901204
Column Sum/(N-					0.164274463	0.003965784
SQRT(Column Su					0.405307862	0.062974472
					· · · · · · · · · · · · · · · · · · ·	
					Transformed conver	ted
			Untransformed	Transformed	to Untransformed	
		Mean	6.59	1.884192263	6.581036547	
		Std Dev	0.405307862	0.062974472	1.064999652	
		Upper Permit Limit	7.390096616	2.007937101	7.447937144	
		Lower Permit Limit	5.797236717	1.760447425	5.815038607	
		Lower refinite Emile				

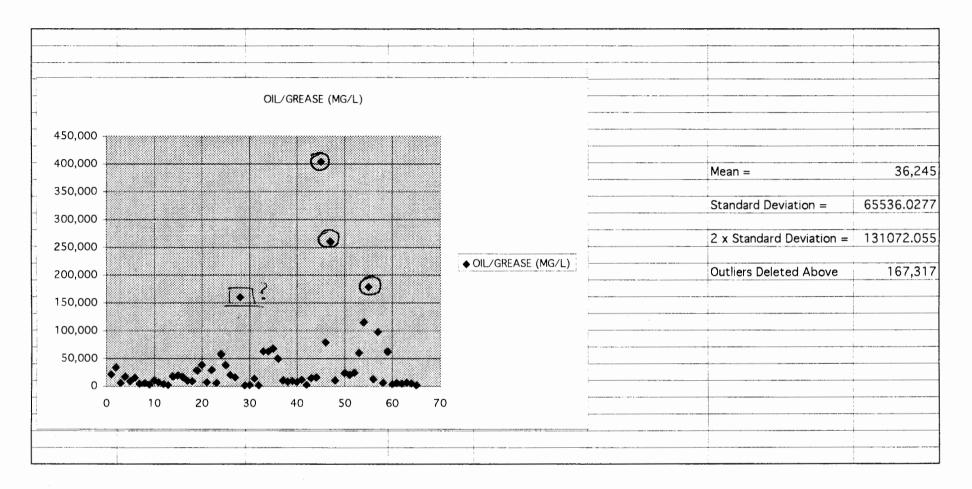
Column A	OR NEW PERMIT LIMITS Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Density	Density	Minus Untransformed	Minus Transformed	Column D	Column E
·	(g/mL)	(g/mL)	Density Value	Density Value	Sguared	Squared
1	0.98	-0.020202707	0.01984127	0.020000315	0.000393676	0.000400013
2	1.02	0.019802627	-0.02015873	-0.02000502	0.000406374	0.000400201
	1.01	0.009950331	-0.01015873	-0.010152723	0.0001032	0.000103078
4		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-08
5	1.02	0.019802627	-0.02015873	-0.02000502	0.000406374	0.000400201
6	#	0.019802627	-0.02015873	-0.02000502	0.000406374	0.000400201
7	1.01	0.009950331	-0.01015873	-0.010152723	0.0001032	0.000103078
8		0.019802627	-0.02015873	-0.02000502	0.000406374	0.000400201
9		-0.020202707	0.01984127	0.020000315	0.000393676	0.000400013
10		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-08
11	1.00	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-08
12		-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
13		-0.020202707	0.01984127	0.020000315	0.000393676	0.00040001
14		0.009950331	-0.01015873	-0.010152723	0.0001032	0.00010307
15		0.009950331	-0.01015873	-0.010152723	0.0001032	0.000103078
16		-0.020202707	0.01984127	0.020000315	0.000393676	0.000400013
17	0.99	-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
18		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
19		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-08
20		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
21	0.99	-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
22		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
23		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
24		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
25		0.009950331	-0.01015873	-0.010152723	0.0001032	0.00010307
26		-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
27		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
28		-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
29			-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
30		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
31	1.00	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
32		0.009950331	-0.01015873	-0.010152723	0.0001032	0.00010307
33		-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
34		-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
35	•	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
36		0.009950331	-0.01015873	-0.010152723	0.0001032	0.00010307
37		-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
38		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
39	1.00	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
40	1.00	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
41		-0.010050336	0.00984127	0.009847944	9.68506E-05	
42	0.99	-0.010050336	0.00984127	0.009847944	9.68506E-05	
43	1.00	0	-0.00015873	-0.000202392	2.51953E-08	
44	1.00	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
45		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
46	0.99	-0.010050336	0.00984127	0.009847944	9.68506E-05	9.6982E-0
47	1.00	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
48		0	-0.00015873	-0.000202392	2.51953E-08	
49		0	-0.00015873	-0.000202392	2.51953E-08	
50	1.00	0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
51		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
52	1.00	0	-0.00015873	-0.000202392		4.09626E-0
53		0		-0.000202392		4.09626E-0
54		0	-0.00015873	-0.000202392		4.09626E-0
55	1.01	0.009950331	-0.01015873	-0.010152723	0.0001032	0.00010307
56		0.009950331	-0.01015873	-0.010152723	0.0001032	0.00010307
57				-0.000202392		4.09626E-0
58	1.00	0	-0.00015873	-0.000202392	2.51953E-08	
59	1.00	.0		-0.000202392		
60			0.00984127	0.009847944		9.6982E-0
61	+	0.009950331	-0.01015873	-0.010152723		0.00010307
62		0.009950331	-0.01015873	-0.010152723	0.0001032	0.00010307
63		0	-0.00015873	-0.000202392	2.51953E-08	4.09626E-0
Column Sum	62.99				0.005498413	
Column Sum/N	1.00					
Column Sum/(N-	d				8.86841E-05	8.87065E-0
SQRT(Column Su					0.009417222	0.00941841
	1			t- · · ·	Transformed conver	ted
		-	Untransformed	Transformed	to Untransformed	T
		Mean	1.00	4	+	
		Std Dev	0.009417222	•		
		Upper Permit Limit	±	1	1.01847335	
		Lower Permit Limit			4	
		LOWER FERRIT LIMIT	0.301330420	3.0.0703373	1	

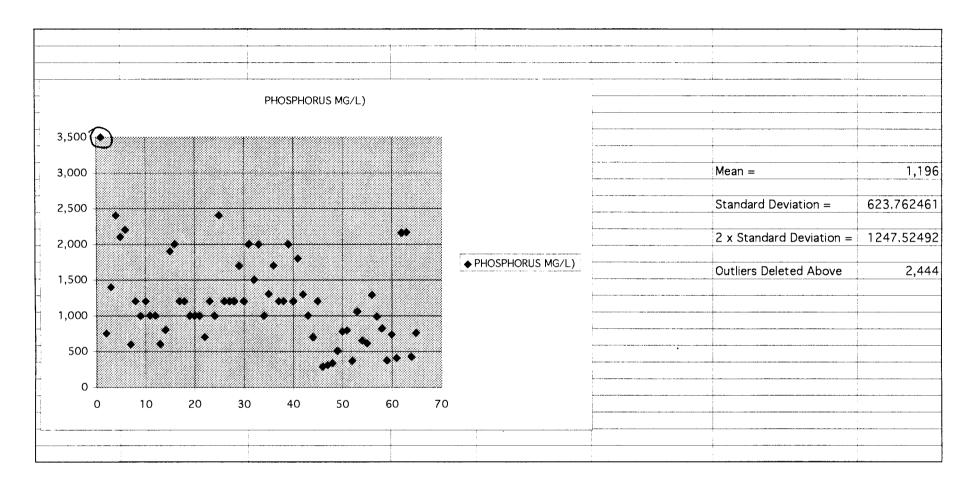
SAMPLE DATE	TOTAL SOLIDS (MG/L)	TOTAL VOLATILE SOLIDS(MG/L)	BOD5 (MG/L)	OIL/GREASE (MG/L)	PHOSPHORUS MG/L)	TOTAL NITROGEN (MG/L)	AMMONIA (MG/L)	PH	DENSITY (G/ML)
09-08-93	17,300	9,920	425,000	20,588	3,500	19,040	8,400	6.65	0.98
10-06-93	6,790	897	33,500	33,370	750	2,940	560	7.06	1.02
10-14-93	8,480	3,390	255,000	5,680	1,400	3,080	840	6.61	1.01
11-03-93	19,200	9,270	30,700	16,700	2,400	5,880	3,450	7.39	1.03
11-09-93	27,500	13,900	32,000	8,520	2,100	6,160	3,480	6.73	1.03
11-16-93	17,600	8,890	27,100	14,580	2,200	7,840	6,580	6.87	1.00
12-06-93	12,100	6,270	13,800	4,006	600	4,480	1,880	6.43	1.02
12-13-93	33,200	25,000	21,000	5,240	1,200	8,120	1,180	6.28 6.86	1.02
01-04-94	15,600	7,170	24,400	2,460	1,000	5,880	2,650	6.74	1.01
01-10-94	7,730	2,440	13,200	10,240	1,200	5,880 5,880	1,850 2,390	6.93	0.98
02-01-94	16,300	8,430	24,100	7,240	1,000	4,760	2,000	6.96	1.00
02-07-94	14,500	7,050 5,090	18,000	3,700	1,000	7,280	2,290	6.94	1.00
03-01-94 03-07-94	11,900	2,870	19,900	1,958 17,440	800	6,160	2,500	6.68	0.99
04-04-94	12,000	5,820	20,100 18,900	19,040	1,900	5,880	2,050	7.00	0.98
04-11-94	12,700	5,980	19,300	16,200	2,000	7,280	2,300	6.72	1.01
05-02-94	5,390	1,430	11,300	9,780	1,200	1,960	1,960	7.36	1.01
05-10-94	9,350	5,940	14,400	8,880	1,200	4,760	1,590	6.32	0.98
06-07-94	33,500	27,000	350,000	28,120	1,000	4,480	2,030	6.02	0.99
06-14-94	45,900	38,400	480,000	37,900	1,000	7,560	2,250	6.16	1.00
07-05-94	22,000	16,400	22,500	7,212	1,000	2,800	1,220	6.25	1.00
07-12-94	64,800	55,300	54,500	28,840	700	4,480	1,440	6.20	1.00
08-01-94	72,400	59,200	73,200	5,788	1,200	3,080	2,800	6.00	0.99
08-08-94	18,700	10,700	26,400	57,260	1,000	7,560	2,240	6.02	1.00
09-06-94	45,300	35,300	57,800	37,660	2,400	3,920	3,370	6.50	1.00
09-12-94	86,300	72,800	99,800	19,460	1,200	4,480	3,530	6.03	1.00
10-03-94	16,200	8,300	21,600	15,940	1,200	8,960	2,960	6.00	1.01
10-25-94	26,000	20,000	23,300	160,000	1,200	6,160	2,170	5.90	0.99
11-01-94	22,600	10,300	24,200	919	1,700	7,280	3,340	5.30	1.00
11-06-94	24,600	15,400	20,700	1,789	1,200	7,560	3,240	5.60	0.99
12-05-94	20,700	11,000	16,000	13,360	2,000	5,320	3,530	5.40	1.00
12-12-94	18,400	8,850	15,600	1,161	1,500	7,560	3,930	5.00	1.00
01-03-95	22,600	13,000	32,400	62,820	2,000	4,480	3,310	6.70	1.00
01-13-95	10,000	3,190	16,500	62,000	1,000	5,320	2,800	5.00	1.01
02-01-95	12,300	3,420	20,300	68,020	1,300	7,280	3,320	6.80	0.99
02-16-95	13,700	5,730	18,600	49,140	1,700	7,560	2,870	6.70	0.99
03-01-95	12,600	2,170	21,000	10,460	1,200	6,160	3,720	6.50	1.00
03-09-95	16,900	7,200	39,100	7,600	1,200	4,480	2,710	6.00	1.01
04-03-95	16,700	7,490	21,500	9,360	2,000	5,264	2,550	6.80	0.99
04-13-95	19,300	12,200	26,600	7,600	1,200	6,348	2,690		1.00 1.00
05-01-95	24,000	16,100	36,200	11,440	1,800	5,040	2,730	6.60	
05-12-95	15,700	9,500	22,900	2,240	1,300	7,840	2,420 2,340	6.80	1.00 0.99
06-01-95	16,100	8,690	29,100	14,780	1,000	7,840 4,760	2,050	6.60	0.99
06-16-95	15,700 15,700	7,460	27,400 19,400	15,580 404,200	1,200	6,160	2,170	6.90	1.00
07-05-95 07-18-95	15,600	7,280 7,260	18,000	78,640	287	7,560	2,210	7.10	1.00
08-02-95	17,000	7,510	20,500	259,880	310	7,560	2,400	6.60	1.00
08-02-95	14,700	6,640	18,700	10,120	333	8,400	2,290	6.80	0.99
09-06-95	10,600	3,860	18,900	10,120	507	8,960	2,300	6.60	1.00
09-12-95	37,000	27,900	43,500	23,800	780	17,640	2,760	6.70	1.00
10-03-95	35,400	25,200	32,000	20,500	793	8,120	2,900	7.00	1.00
11-06-95	14,700	7,540	29,200	24,600	368	5,880	2,870	6.20	1.00
12-06-95	18,700	9,760	24,600	59,920	1,059	8,400	2,670	6.60	1.00
JAN.96	16600	7860	23900	115060	6 55	7280	2790	6.5	1.00
FEB.96	74300	69400	41300	178560	616	6720	1260	6.7	1.00
MAR.96	18200	11900	23100	12468	1287	8960	2150	6.5	1.00
APR96	22500	13400	27000	97560	984	5880	3080	6.7	1.01
	13200	6130	14200	97560 5590	818	5320	1930	7.0	1.01
MAY96					the contract of the contract o			6.9	
JUN96	9740	4530	12500	62200	371	5320	1730		1.00
JUL96	21600	10400	21700	3760	736	5600	2440	6.8	1.00
AUG96	35100	23900	29500	5200	404	3080	2440	7.3	1.00
SEP96	16280	10400	18400	3860	2156	11760	1840	7.0	0.99
OCT96	34400	22700	19400	6380	2163	3640	2420	6.54	1.01
NOV96	37400	26300	21000	4375	427	3360	2260	6.61	1.01
DEC96	31400	16700	15300	910	759	3080	2050	6.46	1.00

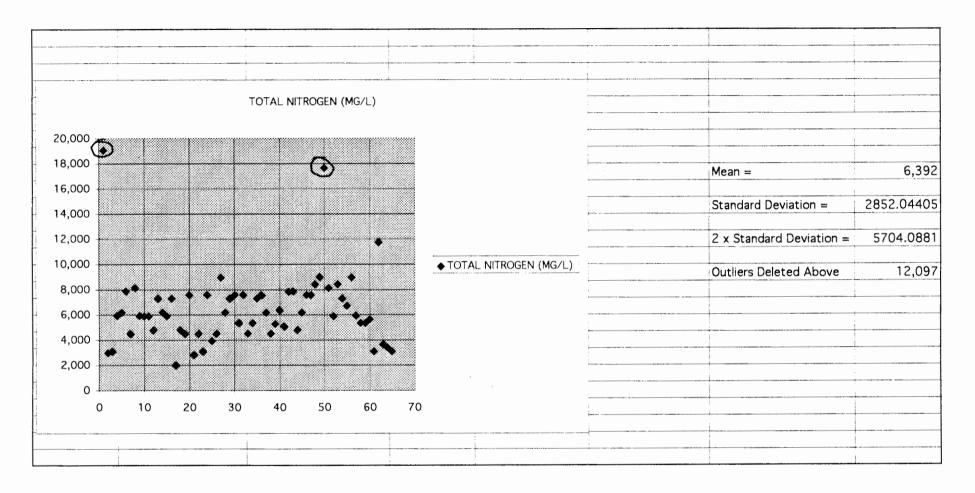


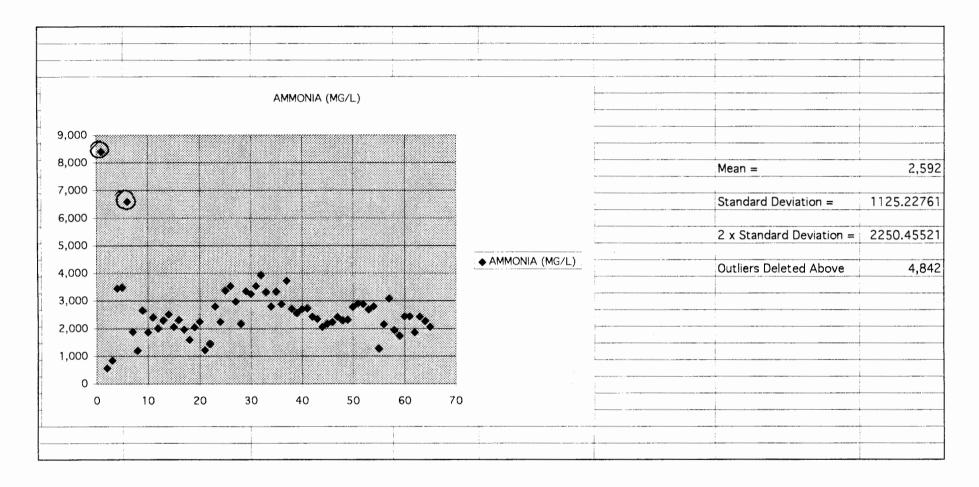




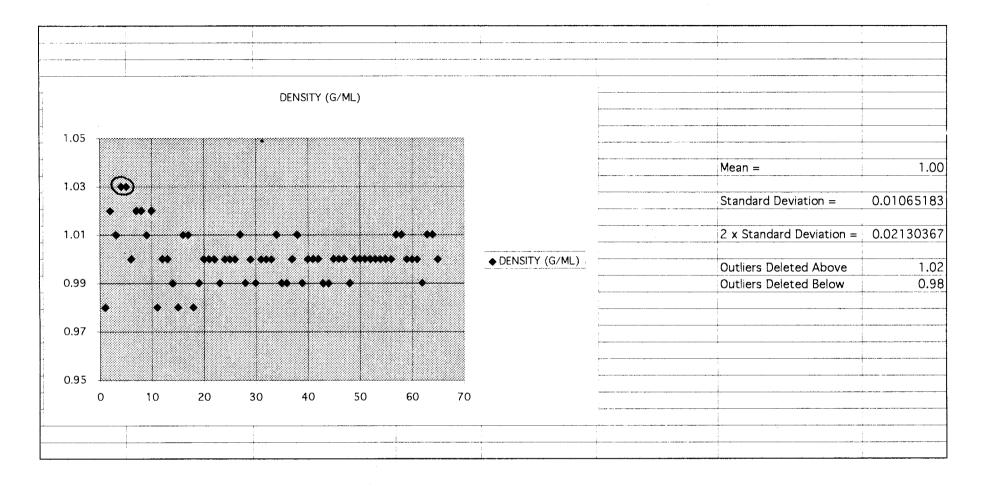








		PH					
9						Mean =	6.52
						Standard Deviation =	0.51000622
•	•			•	<u> </u>	2 x Standard Deviation =	1.02001245
7	*:-	. *. *.			◆ PH	Outliers Deleted Above	7.54
6	1.4.1.	•	•	**		Outliers Deleted Below	5.50
0	7	\$ 0					
5	(00			<u> </u>		
4 <u> </u>	20 3	i 40	50	60	70		



StarKist Samoa, Inc.



January 09, 1998

A Division of Star-Post Foods, Inc. P.O. Box 368

Pago Pago, Tutulla Island American Sanioa, 96799

Telephone 684 644-4231 Facsimile 684 644-2440

Mr. Norman Lovelace OPINAP (E-4) U.S. EPA Region 9 75 Hawthorne St. San Francisco, CA 94105

Mr. Togipa Tausaga ASEPA Office of the Governor American Samoa Government Pago Pago, American Samoa 96799

Gentlemen:

Re: OCEAN DUMPING REPORT UNDER OD-93-01

Pursuant to Special Condition 3.3 of the above referenced Ocean dumping permit, attached are the summary reports for the period of September 1997 to November 1997.

The monthly data include all the chemical analyses for the DAF sludge, cooker water, press liquor and onshore storage tank.

All parameters were met.

Sincerely,

VIRGIL SHOUSE

Manager, Cannery Manufacturing

VS\ls:

cc:

B. Mills

P. Young

S. Wiegman

Coast Guard Liaison Officer

Project Leader - USFWS Program Officer - NMFS

Executive Director - WPRFMC

APPENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month: September 1997

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)
01-Sep-97	5,062.5	11,812.5	16,875	33,750	0
02-Sep-97	13,312.5	31,062.5	44,375	88,750	78,125
03-Sep-97	14,437.5	33,687.5	48,125	96,250	73,125
04-Sep-97	16,125	37,625	53,750	107,500	130,625
05-Sep-97	21,375	49,875	71,250	142,500	132,500
06-Sep-97	2,625	6,125	8,750	17,500	0
07-Sep-97	6,375	14,875	14,875 21,250 4		0
08-Sep-97	20,062.5	46,812.5	66,875	133,750	155,625
09-Sep-97	15,000	35,000	50,000	100,000	103,125
10-Sep-97	18,187.5	42,437.5	60,625	121,250	141,875
11-Sep-97	17,250	40,250	57,500	115,000	71,875
12-Sep-97	18,937.5	44,187.5	63,125	126,250	137,500
13-Sep-97	4,500	10,500	15,000	30,000	86,875
14-Sep-97	9,375	21,875	31,250	62,500	0
15-Sep-97	13,500	31,500	45,000	90,000	88,125
16-Sep-97	17,625	41,125	58,750	117,500	123,750
17-Sep-97	19,500	45,500	65,000	130,000	81,875
18-Sep-97	29,250	68,250	97,500	195,000	97,500
19-Sep-97	25,875	60,375	86,250	172,500	131,875
20-Sep-97	6,000	14,000	20,000	40,000	138,750
21-Sep-97	14,250	33,250	47,500	95,000	0
22-Sep-97	21,750	50,750	72,500	145,000	103,750
23-Sep-97	16,687.5	38,937.5	55,625	111,250	111,875
24-Sep-97	22,687.5	52,937.5	75,625	151,250	143,750
25-Sep-97	19,875	46,375	66,250	132,500	91,250
2∂-Sep-97	19,500	45,500	65,000	130,000	136,250
27-Sep-97	9,000	21,000	30,000	60,000	73,750
28-Sep-97	6,750	15,750	22,500	45,000	0
29-Sep-97	15,000	35,000	50,000	100,000	160,000
30-Sep-97	16,875	39,375	56,250	112,500	77,500
Monthly Totals	456,750	1,065,750	1,522,500	3,045,000	2,671,250

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 17265.5 Pounds / Month Coagulant polymer: 526,7 Pounds / Month

APPENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month: October 1997

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)
01-Oct-97	18,000	42,000	60,000	120,000	131,250
02-Oct-97	22,500	52,500	75,000	150,000	143,750
03-Oct-97	18,937.5	44,187.5	63,125	126,250	124,375
04-Oct-97	9,000	21,000	30,000	60,000	78,125
05-Oct-97	11,437.5	26,687.5	38,125	76,250	106,875
06-Oct-97	10,687.5	24,937.5	35,625	71,250	116,875
07-Oct-97	17,625	41,125	58,750	117,500	153,750
08-Oct-97	13,687.5	31,937.5	45,625	91,250	65,625
09-Oct-97	21,375	49,875	71,250	142,500	141,250
1u-Oct-97	15,937.5	37,187.5	53,125	106,250	129,375
11-Oct-97.	3,750	8,750	12,500	25,000	75,625
12-Oct-97	0	0	0	0	0
13-Oct-97	0	0	0	0	0
14-Oct-97	0	0	0	0	0
15-Oct-97	0	0	0	0	0
16-Oct-97	0	0	0	0	0
17-Oct-97	0	0	0	0	0
18-Oct-97	0	0	0	0	0
19-Oct-97	4,500	10,500	15,000	30,000	0
20-Oct-97	8,625	20,125	28,750	57,500	0
21-Oct-97	16,687.5	38,937.5	55,625	111,250	88,125
22-Oct-97	16,125	37,625	53,750	107,500	143,750
23-Oct-97	18,187.5	42,437.5	60,625	121,250	139,475
24-Oct-97	12,562.5	29,312.5	41,875	83,750	88,750
25-Oct-97	4,125	9,625	13,750	27,500	76,250
26-Oct-97	1,950	4,550	6,500	13,000	0
27-Oct-97	14,812.5	34,562.5	49,375	98,750	52,400
28-Oct-97	14,437.5	33,687.5	48,125	96,250	93,750
29-Oct-97	12,000	28,000	40,000	80,000	86,250
30-Oct-97	11,812.5	27,562.5	39,375	78,750	109,100
31-Oct-97	24,000	56,000	80,000	160,000	130,750
Monthly Totals	322,763	753,113	1,075,875	2,151,750	2,275,475

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum Sulfate: 15395.1 Pounds / Month Coagulant Polymer: 468.0 Pounds / Month

APPENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month: November 1997

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (galions/day)
01-Nov-97	5,205	12,145	17,350	34,700	75,000
02-Nov-97	2,910	6,790	9,700	19,400	120,650
03-Nov-97	12,712.5	29,662.5	42,375	84,750	0
04-Nov-97	13,935	32,515	46,450	92,900	76,650
05-Nov-97	25,102.5	5,102.5 58,572.5 83,675		167,350	131,000
06-Nov-97	13,687.5	31,937.5 45,625		91,250	135,700
07-Nov-97	15,855	36,995	995 52,850 105		166,800
08-Nov-97	3,097.5	7,227.5	10,325	20,650	80,200
09-Nov-97	375	875	1,250	2,500	0
10-Nov-97	0	0	0	0	10,000
11-Nov-97	375	875	1,250	2,500	0
12-Nov-97	0	0	0	0	0
13-Nov-97	2,625	6,125	8,750	17,500	0
14-Nov-97	5,437.5	12,687.5	·		0
15-Nov-97	750	1,750	2,500	5,000	0
16-Nov-97	1,500	3,500	5,000	10,000	0
17-Nov-97	17,250	40,250	57,500	115,000	70,000
18-Nov-97	16,687.5	38,937.5	55,625	111,250	102,500
19-Nov-97	16,500	38,500	55,000	110,000	103,750
20-Nov-97	11,062.5	25,812.5	36,875	73,750	85,000
21-Nov-97	8,812.5	20,562.5	29,375	58,750	71,250
22-Nov-97	6,000	14,000	20,000	40,000	72,500
23-Nov-97	3,750	8,750	12,500	25,000	0
24-Nov-97	5,062.5	11,812.5	16,875	33,750	73,250
25-Nov-97	7,687.5	17,937.5	25,625	51,250	33,750
26-Nov-97	8,062.5	18,812.5	26,875	53,750	62,750
27-Nov-97	1,500	3,500	5,000	10,000	72,500
28-Nov-97	1,125	2,625	3,750	7,500	0
29-Nov-97	375	875	1,250	2,500	0
30-Nov-97	3,187.5	7.437.5	10.625	21,250	0
Monthly Totals	210,630	491,470	702,100	1,404,200	1,543,250

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum Sulfate:

10621.0 Pounds / Month Coagulant Polymer: 348.4 Pounds / Month

APPENDIX B - REPORT FORM 2 Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA 102 Permit #OD 93-01

Reporting Period: From September 1997

to

November 1997

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
09-11-97	31,800	16,100	48,098	16,235	626	5,190	3,770	6.66	1.00
09-18-97	23,500	10,800	46,452	13,923	561	4,720	3,570	6.70	0.99
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	0.93 to 1.0

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
10-23-97	33,000	17,100	38,246	12,269	566	6,320	4,030	6.90	1.02
10-31-97	30,000	11,100	30,041	4,356	353	3,350	1,980	6.80	1.01
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	.93 to 1.0

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
11-20-97	29,800	17,400	38,293	15,169	460	4,810	3,340	6.90	1.00
11-28-97	53,900	37,100	49,559	15,608	506	5,030	3,450	6.70	1.01
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	0.93 to 1.05

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

Sept 11, 97		TSS	TVSS	ТР	TN	O&G	Ammonia
		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
	Depth (m)	Aecos	Aecos	Aecos	Aecos	Aecos	Aecos
Station 1	1	4.0	2.0	0.040	0.5	1.95	0.018
	control-1	6.0	4.0	0.010	1.0	1.82	0.024
	3	4.0	2.0	0.020	0.5	3.78	0.050
	control-3	4.0	2.0	0.040	1.0	1.77	0.017
	10	4.0	2.0	0.030	2.0	0.20	0.044
	control-10	6.0	2.0	0.020	1.0	0.59	0.017
Station 2	1	8.0	6.0	0.030	1.0	0.20	0.029
	3	4.0	2.0	0.020	1.0	4.32	0.068
	10	4.0	2.0	0.030	1.0	1.16	0.059
Station 3	1	4.0	2.0	0.030	0.5	1.20	0.028
	3	6.0	4.0	0.010	1.0	2.15	0.028
	10	4.0	2.0	0.050	1.0	0.59	0.031
Station 4	1	4.7	2.8	0.020	0.5	2.16	0.020
	3	4.0	2.0	0.030	0.5	0.40	0.017
	10	4.0	2.0	0.010	1.0	0.58	0.018
Station 5	1	4.0	2.0	0.020	1.0	0.76	0.017
,	3	3.7	1.8	0.010	0.5	0.20	0.016
	10	4.0	2.0	0.010	0.5	0.60	0.018

Oct 23,97		TSS	TVSS	TP	TN	O&G	Ammonia
	n Skill herksp	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
:	Depth (m)	Aecos	Aecos	Aecos	Aecos	Aecos	Aecos
Station 1	1	4.0	1.0	0.010	1.0	5.20	0.060
	control-1	4.0	1.0	0.040	1.0	2.40	0.066
	3	2.0	1.0	0.010	1.0	2.80	0.040
	control-3	6.0	2.0	0.030	1.0	0.60	0.019
	10	4.0	1.0	0.020	1.0	0.40	0.078
	control-10	6.0	3.0	0.030	1.0	1.40	0.039
Station 2	1	3.0	1.0	0.030	1.0	2.60	0.081
	3	2.0	1.0	0.020	1.0	3.40	0.042
	10	6.0	1.0	0.020	1.0	0.20	0.122
Station 3	1	4.0	1.0	0.030	1.0	0.40	0.028
	3	2.0	1.0	0.030	1.0	1.60	0.032
	10	7.0	2.0	0.020	1.0	0.20	0.069
Station 4	1	5.0	3.0	0.020	1.0	0.20	0.051
	3	2.0	1.0	0.020	1.0	0.80	0.047
	10	2.0	1.0	0.020	1.0	1.40	0.114
Station 5	1	4.0	1.0	0.030	1.0	1.20	0.027
	3	6.0	1.0	0.060	1.0	2.60	0.151
	10	6.0	2.0	0.020	1.0	0.40	0.058

TSS is reported as non-filterable residue

TVSS is reported as volatile non-filterable residue

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

Nov 20, 97	Depth (m)	TSS mg/l Aecos	TVSS mg/l Aecos	TP mg/l Aecos	TN mg/l Aecos	O&G mg/l Aecos	Ammonia mg/l Aecos
Station 1	1	4.5	1.5	0.055	1.00	1.90	0.022
	control-1	4.5	2.5	0.065	1.00	1.20	0.037
	3	5.0	1.5	0.070	0.50	0.60	0.007
	control-3	4.0	1.5	0.055	0.50	0.10	0.015
	10	5.5	1.5	0.045	0.50	1.50	0.005
	control-10	3.0	1.5	0.060	1.50	3.90	0.017
Station 2	1	4.5	1.5	0.055	1.00	0.30	0.005
	3	4.0	2.0	0.050	0.50	0.40	0.011
	10	4.5	2.0	0.065	0.50	0.80	0.030
Station 3	1	4.0	2.0	0.060	1.00	0.40	0.012
	3	3.5	1.0	0.035	0.50	0.60	0.026
	10	3.0	1.5	0.060	1.00	0.30	0.050
Station 4	1	3.0	1.0	0.040	0.50	0.90	0.012
	3	3.0	1.5	0.070	1.00	0.50	0.038
	10	3.5	1.0	0.130	1.00	0.30	0.053
Station 5	1	4.5	1.5	0.045	1.50	1.50	0.029
	3	3.0	1.0	0.090	1.00	1.00	0.038
	10	4.5	1.5	0.050	0.50	0.50	0.047

TSS is reported as non-filterable residue TVSS is reported as volatile non-filterable residue

Monitoring report for at sea dumping of Starkist and Samoa Packing tuna fish cannery waste liquids.

September 11, 1997

Monitoring vessel: M/V Tasman Sea

Discharge vessel: M/V Tasman Sea

Chief investigator: Robert Dennis

Starkist liaison: Lesina

Determination of sampling positions : All positions obtained by (GPS) Global Positioning Satellite System.

Introduction.

On **September 11**, **1997** the motor vessel Tasman Sea transported personnel to the Designated dump site area seven miles south of Pago Pago Harbor in American Samoa for the purpose of discharging and monitoring Starkist and Samoa Packing tuna fish cannery's waste liquids into the waters of the South Pacific Ocean .

This Monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02. Sea water samples where drawn at depth of one, three, and, ten meters from the control station and (after the discharge) stations one through five. Water temperature, pH, time and position, along with observations on sea water color, odor, and floating materials are recorded in Table 1. Observations on Weather, sea conditions, and sea life are noted in the following chronology.

Chronology of monitoring activities.

- <u>05:30</u> The Tasman sea departed Starkist's dock and proceeded to the designated dumpsite location .
- <u>06:29</u> Control station monitoring. The Tasman Sea arrived at the dumpsite center. Standard sea water samples were carried out, and measurements taken. Skies were clear, winds were from the north east at 10 to 12 mph. A 2 ft swell

and light chop were also coming from the north east at 16 to 12 mph. A2 it swell and light chop were also coming from the north east. Drift of the vessel indicated a 2 mph westerly current. The barometer read 29.79 millibars. No sea life was evident at this location.

- <u>06:40</u> The Tasman Sea departed the dump site center and proceeded 1.1 miles to the north east where it began disposal operations. The ship discharged along a north west to south east long oval according to permit guidelines. The disposal operations continued until <u>09:45</u>.
- 10:00 Station one monitoring. Standard sea water samples were collected and measurements recorded as in the . The weather and sea conditions were the same as during the control station motoring , and remained the same for the remainder of the monitoring day . A large flock of sea birds were intently feeding at the surface a short distance away (a good indication of small fish as well as a school of skip jack tuna in the area) .
- <u>10:08</u> Station two monitoring. Standard sea water samples were collected and measurements recorded. The sea birds had broken up and gone by this time and on other sea life was evident at this location.
- **10:17 Station three monitoring.** Standard sea water samples were collected and measurements recorded. No sea life was evident at this location.
- 10:25 Station four monitoring. Standard sea water samples were collected and measurements recorded. No sea life was evident at this location.

10:38 Station five monitoring. Standard sea water samples were collected and measurements recorded at the edge of the plume which due to the conflicting wind and current was moving of to the south. No sea life was evident at this location. Monitoring operations were concluded at 10:43 The plume continued moving of to the south as the Tasman Sea returned to port.

Submitted by;

Robert Dennis,

Chief Engineer / manager M/V Tasman Sea .

SPECIAL OCEAN DUMPING RESEARCH PERMIT: OD-93-01. TABLE 1

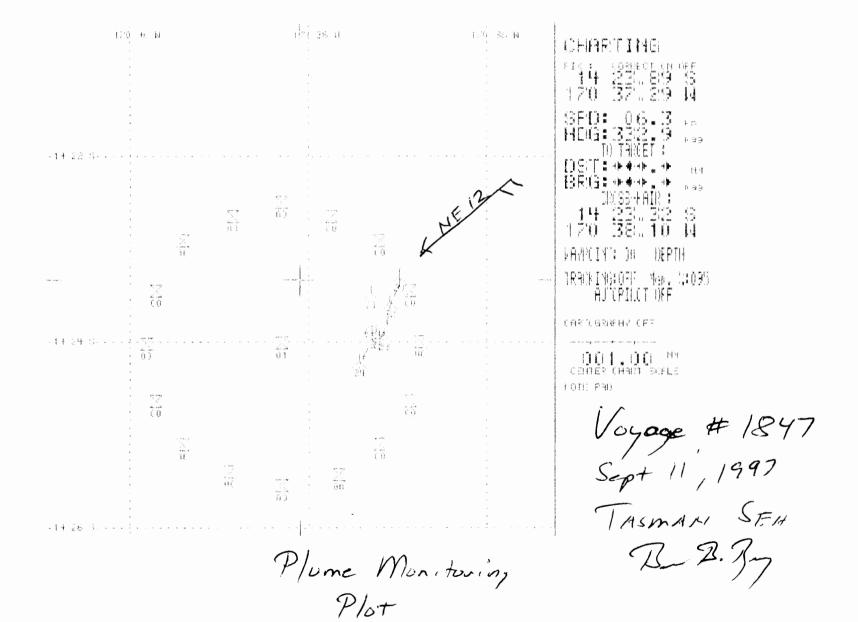
September 11, 1997

Weather and Sea Conditions: Skies were clear, winds were from the north east at 10 to 12 mph. . A two foot swell and light chop were also coming from the north east. Drift of the vessel and the plume indicated a two mph. westerly current, the barometer reading was 29.79 Millibars. The weather remained the same throughout the monitoring.

Time	Station	Depth	Temp.(*F)	рΗ	Odor	Color	Floating material
		1 m.	80	8		Clear deep	No floating mater
06:29	Control	3 m.	80	8	None	blue	
		10 m.	80	8			
		1 m.	81	8		cloudy	surface sheen stretching to the
10:00	Station 1	3 m.	81	8	pungent	aqua	north , south , and west .
		10 m.	80	8			
		1 m.	80.5	8		cloudy	surface sheen as in st. one , also
10:08	Station 2	3 m.	80.5	8	Pungent	aqua	patches of greasy particulat mater
		10 m.	80	8		1	
		1 m.	80.5	8		Slight	Patchy surface sheen , and grease
10:17	Station 3	3 m.	80.5	8	Pungent	cloudy	partiulat to the north , south , and to
		10 m.	80	8		aqua	the east . (at the west edge of plume
		1 m.	80.5	8	Faint	Very slight	No noticable floating mater .
10:25	Station 4	3 m.	80.5	8	Pungent	cloudy	
		10 m.	80	8		blue	
		1 m.	80.5	8		cloudy	Patchy surface sheen , and grease
10:38 Station 5	3 m.	80.5	8	Pungent	aqua	partiulat to the north , south , and to	
		10 m.	80	8		<u> </u>	the east . (at the west edge of plume

Stations Positions.							
	Latitude		Longitude				
Control	14*24	south	170*38.3	west			
Station 1	14*23.3	south	170*36.9	west			
Station 2		south	170*37.1	west			
Station 3	14*23.9	south	170*37.1	west			
Station 4	14*24.2	south	170*37.4	west			
Station 5	14*23.9	south	170*37.2	west			

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Monitoring report for at sea dumping of Starkist and Samoa Packing tuna fish cannery waste liquids.

October 23, 1997

Monitoring vessel: M/V Tasman Sea

Discharge vessel: M/V Tasman Sea

Chief investigator : Robert Dennis

Starkist liaison: Lesina

Determination of sampling positions : All positions obtained by (GPS) Global Positioning

Satellite System.

Introduction.

On **October 23**, **1997** the motor vessel Tasman Sea transported personnel to the Designated dump site area seven miles south of Pago Pago Harbor in American Samoa for the purpose of discharging and monitoring Starkist and Samoa Packing tuna fish cannery's waste liquids into the waters of the South Pacific Ocean .

This Monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02. Sea water samples where drawn at depth of one, three, and, ten meters from the control station and (after the discharge) stations one through five. Water temperature, pH, time and position, along with observations on sea water color, odor, and floating materials are recorded in Table 1. Observations on Weather, sea conditions, and sea life are noted in the following chronology.

Chronology of monitoring activities.

- <u>05:30</u> The Tasman sea departed Starkist's dock and proceeded to the designated dumpsite location .
- Control station monitoring. The Tasman Sea arrived at the dumpsite center. Standard sea water samples were carried out, and measurements taken. Skies were partly cloudy, winds were from east north east at 18 to 22 mph. A 8 ft swell and a 3 to 5 foot chop were also coming from east north east. Drift of the vessel indicated a 2 mph westerly current. The barometer read 29.82 millibars. No sea life was evident at this location.
- <u>06:35</u> The Tasman Sea departed the dump site center and proceeded 1.1 miles to the north east where it began disposal operations at <u>6:40</u>. The ship discharged along a north by north west to south by south easterly long oval according to permit guidelines. The disposal operations continued until <u>09:45</u>.
- <u>09:57</u> Station one monitoring. Standard sea water samples were collected and measurements recorded as in the . The weather and sea conditions were the same as during the control station motoring , and remained the same for the remainder of the monitoring day . No sea life was evedent at this time .
- 10:02 Station two monitoring. Standard sea water samples were collected and measurements recorded. No sea life was evident at this time.
- 10:12 Station three monitoring. Standard sea water samples were collected and measurements recorded. No sea life was evident at this location.
- 10:19 Station four monitoring. Standard sea water samples were collected and measurements recorded. Several Boobys were flying low over the water and seemed to be patroling for fish.
- 10:27 Station five monitoring. Standard sea water samples were collected and measurements recorded at the edge of the plume which was moving of to the west

. No sea life was evident at this location . Monitoring operations were concluded at 10:35 The plume continued moving of to the west as the Tasman Sea returned to port .

Submitted by;

Robert Dennis,

Chief Engineer / manager M/V Tasman Sea .

SPECIAL OCEAN DUMPING RESEARCH PERMIT: OD-93-01. TABLE 1 October 23, 1997

Weather and Sea Conditions: Skies were Partly cloudy, winds were from the east by north east at 18 to 22 mph.

An 8ft swell and 3ft to 5ft chop were also coming from theeast by north east. Drift of the vessel and the plume indicated a 2 mph westerly current, the barometer reading was 29.79 Millibars. The weather remained the same throughout the day.

Time	Station	Depth	Temp.(*F)	рΗ	Odor	Color	Floating material
		1 m.	80.5	8.3		Clear deep	No floating mater
06:32	Control	3 m.	80.5	8.3	None	blue	
		10 m.	80.5	8.3			
		1 m.	80.5	8.3		Slight	No floating mater
09:57	Station 1	3 m.	80.5	8.3	pungent	cloudy	
		10 m.	80.5	8.3		blue	
		1 m.	80.5	8.3		cloudy	No floating mater
10:02 S	Station 2	3 m.	80.5	8.3	Pungent	aqua	
		10 m.	80.5	8.3			
		1 m.	80.5	8.3		very	Patchy surface sheen .
10:12 Sta	Station 3	3 m.	80.5	8.3	Pungent	cloudy	
		10 m.	80.5	8.3		aqua	
		1 m.	80.5	8.3		cloudy	Patchy surface sheen .
10:19 Sta	Station 4	3 m.	80.5	8.3	Pungent	aqua	
	1	10 m.	80.5	8.3			
		1 m.	80.5	8.3		cloudy	No floating mater
10:27	Station 5	3 m.	80.5	8.3	Pungent	aqua	
		10 m.	80.5	8.3			

Stations Positions.							
	Latitude		Longitude				
Control	14*24	south	170*38.2 west				
Station 1	14*23.9	south	170*37.2 west				
Station 2	14*24.0	south	170*37.4 west				
Station 3	14*24.0	south	170*37.7 west				
Station 4	14*24.3	south	170*38.2 west				
Station 5	14*24.5	south	170*38.8 west				

MASTER, EDV TASMAN SEA THAT THE C OFCURSO IN THE WANNER REQUIRED BY THE PERMITS, OD 93-01 APP OF 93-02 ISEONVUNDOO TYNSAN CETON JAIRETAM EJBATAOJE PO MOTTROS CM. 257 SECAM TOJA NOITADIVAN A 87 PRESENCE OF LAST TRIPLS PLUKTE? SUNOU LIME BOW GETAR BORANOS C MINURS AVERACE SPEED DURING DISCHARGE STON MINURS DISCHARGE RATE. นะ อยสนมเมา เดเสบอเ DIRECTION OF PLUME: WYS. 175/11 AT CENTER: NOW AT END OF DISHOARGE UI SEENT DIMEONONS: Callons TOTAL: GEGACT SEMPLOV SUOJIBO SOA Suo: 85 STAR-KIST: JEM ISTRICT SISTERS MALL WC >> 07: S9'91 71 (52) wis observed a sound of 7.77 0 400 Commissio Discharging (4232) 3 CHA 1 777 CH3 C 21/2 M 5/28021 8 LIOCKENA てかい 8011 8 IT TOTABAN と ラリ TA SUIDONEAN 00/1 S 7.22 Waypoin # 27% EGAL S IF INTOGRADOIN BY M Z'ZEOZE S 98.200 MAZEOZIS M MICHAELY STAGO 52576 TODE: 1 Jun jun ME JUIODA BAYA THE TAR مناة داند M 62806 8 5787 M 2 6021 S 14237 STREET AND ADOLL S -15 0 رز خاون # IUIOCADA CAR C MELLECAL S 45.674 Cr. 2.2 THE WHOOMERADORE STATE M 0'4801 0 52.274 CACONO SE JUICGNEAN OF THE M 54531 8 02241 -566 5860 W 6,75071 8 6,75211 W 6,75071 8 6,7521 THUIOGKEAN LITTLE ンファ LE LUICOARANT PARE 550 WILLOCKS MISSISSIAN 171 14537 8 120323 M. OLI # JUIOGAUM 9/ M 94001 8 8 64001 -A TZEOZES 200 2-2 MANOGARAA らどてかし 1 172.57 N 1400/2 8 6 67575 PC) Buibieyosip Gound 100 040/0 56 $-c_{c_{1}}$ $O_{c_{1}}$ M / 4-8042 S 6 Ch 6 UE. 3110 1.5.271 15 Crive dispersion in center (01) 14 24,05 170 33,3VV 7/22/10 0//3 C+ 1-1 20050 EINEN M 7/8 8021 8 7/7 27 (OT) BIS ICSOCS DEALLY (1050 JIM ·//ショ: DIS ESCUSID 10; LIBCUC DESC MC 15 0/1 39'91 51 Leal losein . VCS Product Johnoud SOA Julpeol ulje. List opding Starkest Product consold signification of the SUO CESES TIEMS OFI TEKTAEW C. W NOLLISOS BITEL SMING 655/ 65 MO JAY EINO NOAVŒE MINEELS S0-88 GC CVA 10-89 GO ISBERNON LEADER EDVA IVENUU SEV OC IVA DUNISME FOR

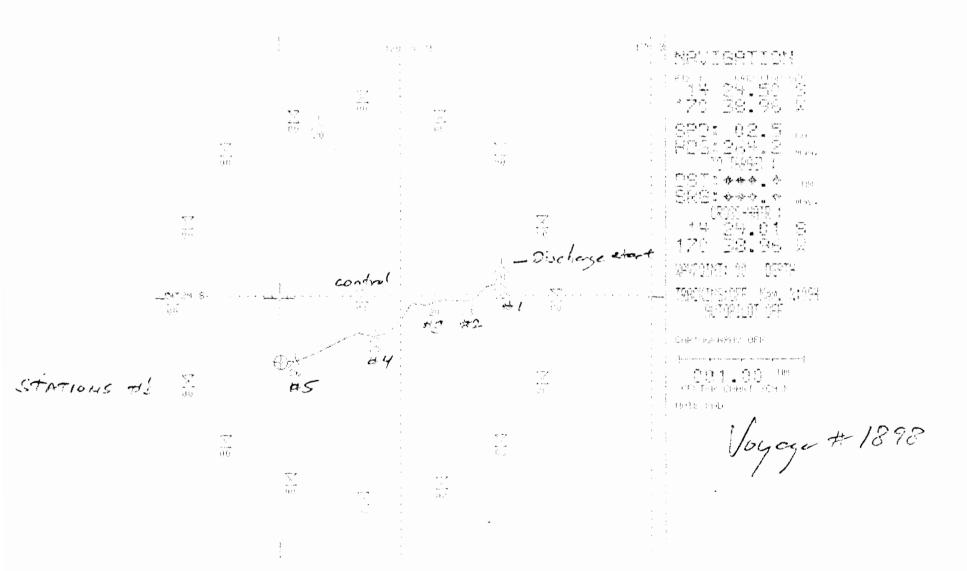
11/10/11/1/



HOLE PRO

Voyage # 1398 Thurs Oct 23 1997

TASMAN SEA The B. Juny



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StarKist Samoa, Inc.



A Division of Star-Kist Foods, Inc.

Millie - Year and

P.O. Box 368 Pago Pago, Tutuila Island American Samoa 96799

Telephone: 684 644-4231 Facsimile: 684 644-2440

February 23, 1998

Mr. Norman Lovelace OPINAP (E-4) US EPA Region 9 75 Hawthorne Street San Francisco, CA 94105

RE: OD 98-01 Section 4.5

Gentlemen:

In fulfillment of our new Ocean Dumping Permit OD 98-01 we are submitting the following attached information of the navigational plotting system used by the contracted waste transporter TASMAN SEA for your review and approval:

SECTION 4.5

The permittee shall submit the description, specifications and example hard copy plots for the computerized navigational system before the date of the first disposal operations under this permit. Disposal operations shall not begin until EPA Region IX and CGLO Pago Pago provide the permittee with written approval for the computerized navigation system and the hard copy plots.

Please respond with your comments and or approval by the effective date of OD 98-01.

Sincerely

Virgil Shouse

Manager, Cannery Manufacturing

VWS:ljs

Attachments

cc: Manager, A.S.E.P.A.

File Copy

F/V TASIMAN SEA

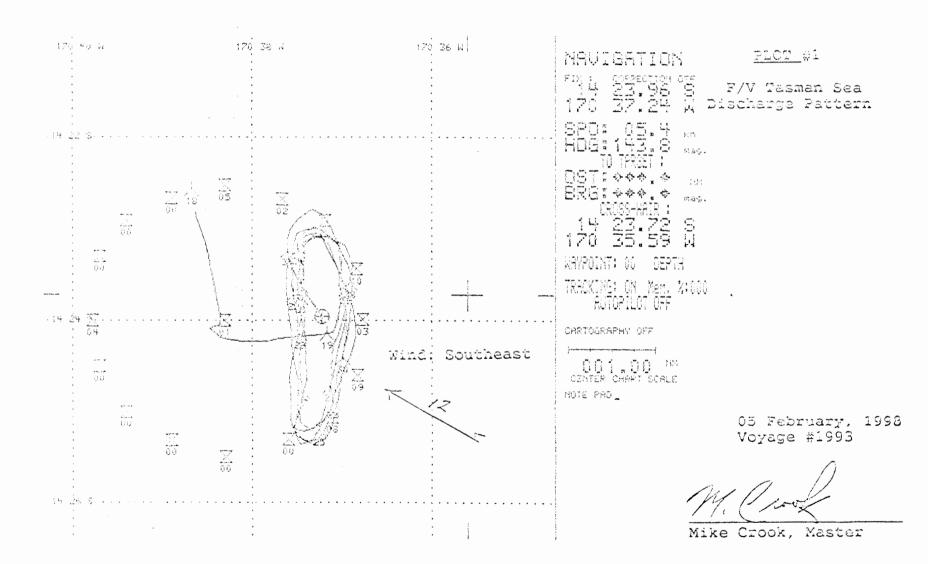
Description of computerized navigational equipment used to determine vessels' position and generate hard copies of vessel track lines and navigational plots:

1) Furuno GP-70 GPS satellite navigator interfaced with an;

2) Echotech CTM 900 video plotter.

3) Kodak DICONIX 180si printer is then used to generate the hard copies.

4) Garmin GPS 45 satellite navigator is a stand by/backup unit in case the Furono malfunctions.



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.; 4				Fig. 23.99 5 Sampling Stations 170 38.28 W # 1-5 SPD: 03.4 m HDG:233.7 mag.
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Mike Crook, Chief Investigator

StarKist Samoa, Inc.



A Division of Star-Kist Foods, Inc.

P.O. Box 368 Pago Pago, Tutuila Island American Samoa 96799

Telephone: 684 644-4231 Facsimile: 684 644-2440

February 26, 1998

Mr. Norman Lovelace OPINAP (E-4) US EPA Region 9 75 Hawthorne Street San Francisco, CA 94105

RE: OD 98-01 SECTION 3.2 ANALYTICAL LABORATORY

Mr. Lovelace:

Pursuant to Section 3.2.1 of our new OD Permit 98-01, the attached report is provided to fulfill this requirement:

Section 3.2.1

Within 30 days of the effective date of this permit, the name and address of the contract laboratory or laboratories and a description of all analytical test procedures and quality assurance/quality control procedures, including detection limits being used, shall be provided to EPA Region IX.

Please review the attachment and provide any comments that would further assist us in our efforts to comply with all regulations under the new Permit.

Sincerely,

Manager, Cannery Manufacturing

VWS:ljs

Attachment

cc: Togipa Tausaga, *Director ASEPA*Joe Carney, *Department Head, Utilities - SKS*File Copy





A Division of Star-Kist Foods, Inc.

P.O. Box 368

Pago Pago, Tutuila Island American Samoa 96799

Telephone: 684 644-4231 Facsimile: 684 644-2440

REPORT REGARDING SECTION 3.2.1 OCEAN DUMPING PERMIT 98-01

LABORATORY:

STAR KIST SAMOA INC. WWTP Laboratory

P.O. BOX 368

Pago Pago, American Samoa 96799 Ph.# (684) 644-4231 ext. 354 / 644-2860 Fax.# (684) 644-1658

Lab Personnel: Lead Specialist Lesina Sivatia

ON SHORE STORAGE TANK FISH WASTES (Sludge Samples)

Physical or Chemical Parameter	*		Detection Limits (OD 98-01 Table 3)
1 arameter	LAB	METHOD	(00)00111000)
Total Solids	SKS	SM 2540 B	101,800
Total Volatile Solids	SKS	SM 2096	84,100
5 Day BOD	SKS	USEPA 405.1	129,390
Oil and Grease	SKS	USEPA 413.1	62,940
Total Phosphorus	SKS	USEPA 365.2	1,750
Total Nitrogen	SKS	SM 4500 N org - D	10, 980
Ammonia	SKS	USEPA 350.3	11,810
pН	SKS	SM 4500 H	6.2 to 7.1
Density	SKS	* SKS	0.97 to 1.03

OCEAN DUMP SITE MONITORING PROGRAM (Seawater Samples)

Physical or Chemical			Detection Limits
Parameter	LAB	METHOD	(OD 98-01Table 4)
Total Suspended Solids	SKS	USEPA 160.2	10.0 mg/L
Total Volatile			
Suspended Solids	SKS	USEPA 160.4	10.0 mg/L
Oil and Grease	SKS	USEPA 413.1	10.0 mg/L
Total Phosphorus	SKS	USEPA 365.2	1.0 mg/L
Total Nitrogen	SKS	SM 4500 N org - D	1.0 mg/L
Ammonia	SKS	USEPA 350.3	1.0 mg/L
pН	SKS	SM 4500 H	0.1 pH units

^{*} A 10 ml graduated cylinder is tared and then filled to volume. The cylinder is reweighed and density is calculated using the following formula: (Sample + tare) in grams minus the tare in grams divided by 10 mls. The result is the weight in grams per ml.

NOTE: SM - Standard Methods

StarKist Samoa, Inc.



Carl Goldstein

American Samoa Program Manager

U.S.E.P.A. Region 1X

75 Hawthorne St.

San Francisco, CA 94105

April 09, 1998

In compliance to the requirement of Section 3.3.3. of Ocean Dumping permit OD 93-01 Section 3.3.3

A summary report of all 3-month reports listed in Special Condition 3.3.1, including a comparisons with permit limits and a detailed discussion of the summary results, shall be submitted by the permittee to EPA and the ASEPA 45 days after the permit expires. All fish processing waste stream data shall be reported in the same format as required in Special Condition 3.3.2

Enclosed is a copy of the "Final Summary Report" summarizing the data collected during the *Auministrative Extension for Ocean Dumping Permit OD 93-01*. Such period covers the menths beginning from August 1996 till February 1998 of the waste and dump site monitoring program for the OD 93-01

The sampling sites are located on land at the Starkist Cannery in American Samoa.

A simple of each waste stream was sampled before they mix consisting of three (3) replicate samples, taken on the scheduled day, pooled for use as a composite sample. This was the case up 1 October 1995 at which time we received an amended section to our report requesting one sample of the streams after they combined.

This report differs from the OD 90-01 report in that the three (3) streams were combined into one sample station in October 95.

Sincerely

Vagil W. Shouse Jr.

M. inger, Cannery Manufacturing

ec Mr. Topgipa Tausaga; A.S.E.P.A. Director

Mr. Norman Lovelace; OPINAP Project Leader of U.S.F.W.S.

Executive Director of WPRFMC

Table1. Star Kist Samoa On Shore Storage Tank Data September 1996 to February 1998 under OD 93-01

		5-Day Biological	Total	Total	Oil &				-
	Total Solids	Oxygen Demand	Phosphorus	Nitrogen	Grease	pН	Total Volatile	Density	Ammonia
Month	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(pH units)	Solids (mg/L)	(g/mL)	(mg/L)
9/15/96	79,600	57,818	981	8,290	23,354	6.80	63,400	1.00	4,550
9/19/96	92,600	55,617	902	6,850	27,124	6.60	70,500	1.02	4,970
10/9/96	54,000	63,379	771	6,890	26,426	6.80	38,600	1.01	3,980
10/29/96	48,200	58,238	694	6,100	11,480	6.70	34,100	1.01	3,180
11/15/96	34,900	43,133	632	5,850	6,845	6.51	20,000	1.03	3,490
12/19/96	55,500	63,530	871	6,520	9,526	6.28	40,500	1.00	3,310
1/10/97	43,500	57,267	637	4,670	13,009	6.20	29,200	1.00	3,280
1/17/97	47,000	72,365	709	4,700	19,901	6.33	35,000	1.00	2,720
2/13/97	219,000	66,320	2,070	11,000	32,944	6.21	190,000	1.00	2,160
2/25/97	38,000	69,732	785	4,090	4,248	6.63	26,100	1.00	2,570
3/20/97	22,200	58,182	771	5,070	7,225	6.80	9,480	1.01	3,230
3/27/97	30,000	70,503	863	5,910	8,240	6.26	15,500	1.00	3,850
4/3/97	24,000	61,329	809	5,250	9,999	7.00	9,690	1.00	3,490
4/11/97	55,400	55,434	1,090	4,170	16,874	6.49	42,700	1.02	1,890
5/15/97	45,900	55,221	655	5,650	16,054	6.60	29,600	1.00	3,520
6/5/97	44,200	41,272	645	5,390	13,954	6.60	25,900	1.00	3,460
6/14/97	40,300	60,051	671	6,740	8,964	6.80	23,800	1.02	4,180
7/10/97	32,100	43,169	577	5,870	7,345	6.70	15,200	1.01	3,870
7/17/97	34,700	39,292	542	6,460	8,834	6.80	20,900	1.02	4,280
8/7/97	63,400	49,674	442	5,830	21,958	6.70	43,300	1.02	4,290
8/14/97	64,300	35,984	568	5,180	10,034	6.66	42,500	1.05	3,640
9/11/97	31,800	48,098	626	5,190	16,235	6.66	16,100	1.00	3,770
9/18/97	23,500	46,452	561	4,720	13,923	6.70	10,800	0.99	3,570
10/23/97	33,000	38,246	566	6,320	12,269	6.90	17,100	1.02	4,030
10/31/97	30,000	30,041	353	3,350	4,356	6.80	11,100	1.01	1,980
11/20/97	29,800	38,293	460	4,810	15,169	6.90	17,400	1.00	3,340
11/28/97	53,900	49,559	506	5,030	15,608	6.70	37,100	1.01	3,450
12/11/97	63,800	40,409	804	6,590	15,622	6.78	49,500	1.01	1,090
12/20/97	25,200	67,615	396	4,150	16,986	6.62	13,300	1.02	2,890
1/7/98	38,900	43,263	483	5,510	13,066	7.20	24,100	1.00	3,410
1/15/98	29,800	40,217	607	6,170	9,155	6.90	16,200	1.02	4,000
2/4/98	43,500	65,840	624	5,270	19,216	6.90	28,200	1.01	3,310
2/12/98	43,700	68,149	759	6,380	20,830	6.94	28,200	1.01	4,270

Table1. Star Kist Samoa On Shore Storage Tank Data September 1996 to February 1998 under OD 93-01

Month	Total Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Oil & Grease (mg/L)	pH (pH units)	Total Volatile Solids (mg/L)	Density (g/mL)	Ammonia (mg/L)
Werter	(1119, 2)	(1119/2)	(1119/12)	(1119/12)	(11.9, 2)	(pri driito)	Condo (mg/L)	(9/1112)	(111972)
]		
				· · · · · · · · · · · · · · · · · · ·					
Maximum	219000	72365	2070	11000	32944	7	190000	1	4970
Minimum	22200	30041	353	3350	4248	6	9480	1	1090
Number	33	33	33	33	33	33	33	33	33
Mean	48961	53142	710	5757	14448	7	33184	1	3425
Std. Dev.	34030	11643	291	1354	6680	0	31355	0	801
Outlier+	151049	88072	1583	9817	34488	7	127250	1	5828
Outlier-	-53128	18212	-163	1696	-5592	6	-60882	1	1022
Upper Lim	it								
Lower Lin									
Rounded L	_imit								
On Shore	Storage Tank	Data With Outliers	s Removed a	nd Recomr	nended Pe	rmit Limits			
Number	33	33	33	33	33	33	33	33	33
Mean	48961	53142	710	6515	26023	7	38367	1	3808
Std. Dev.	34030	11643	291	2018	11729	0	15194	0	1108
Upper Lim	it								
Lower Lim	nit								
Rounded I	_imit								
MPRSA Se	ection 102 Sp	ecial Permit #OD 9	0-01 DAF Slu	dge Limits					:
Upper Lim	it	None	None	None	None	None	None	None	None
Lower Lim	nit								
Changes in	n DAF Sludge	Limits from OD 9	0-01 to OD 93	3-01					
Upper Lim	it	None	None	None	None	None	None	None	None
Percent Cl	hange								
Lower Lim	nit								
Percent Cl	hange								

Read. EPA 10/13/97 mf

StarKist Samoa, Inc.



October 03, 1997

Mr. Norman Lovelace OPINAP (E-4) U.S. EPA Region 9 75 Hawthorne St. San Francisco, CA 94105

Mr. Togipa Tausaga
ASEPA
Office of the Governor
American Samoa Government
Pago Pago, American Samoa 96799

Gentlemen:

Re: OCEAN DUMPING REPORT UNDER OD-93-01

Pursuant to Special Condition 3.3 of the above referenced Ocean dumping permit, attached are the summary reports for the period June 1997 to August 1997.

The monthly data include all the chemical analyses for the DAF sludge, cooker water, press liquor and onshore storage tank.

All parameters were met.

Sincerely

VIRGIL SHOUSE

Manager, Cannery Manufacturing

CC:

B. Mills

P. Young

S. Wiegman

Coast Guard Liaison Officer

Project Leader - USFWS Program Officer - NMFS

Executive Director - WPRFMC

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA 102 Permit #OD 93-01

Reporting Period: From

June 1997

to

August1997

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
06-05-97	44,200	25,900	41,272	13,954	645	5,390	3,460	6.60	1.00
06-14-97	40,300	23,800	60,051	8,964	671	6,740	4,180	6.80	1.02
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	0.93 to 1.05

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
07-10-97	32,100	15,200	43,169	7,345	577	5,870	3,870	6.70	1.01
07-17-97	34,700	20,900	39,292	8,834	542	6,460	4,280	6.80	1.02
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	.93 to 1.0

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
08-07-97	63,400	43,300	49,674	21,958	442	5,830	4,290	6.70	1.02
08-14-97	64,300	42,500	35,984	10,034	568	5,180	3,640	6.66	1.05
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	0.93 to 1.05

Note: An asterisk (*) next to the waste concentration signifies that a violation of the permit limit has occurred.

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month: June 1997

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)
01-Jun-97	8,250	19,250	27,500	55,000	0
02-Jun-97	12,375	28,875	41,250	82,500	78750
03-Jun-97	16,125	37,625	53,750	107,500	158125
04-Jun-97	12,937.5	30,187.5	43,125	86,250	70625
05-Jun-97	13,875	32,375	46,250	92,500	80625
06-Jun-97	12,187.5	28,437.5	40,625	81,250	76250
07-Jun-97	3,375	7,875	11,250	22,500	78125
08-Jun-97	375	875	1,250	2,500	0
09-Jun-97	3,000	7,000	10,000	20,000	0
10-Jun-97	5,812.5	13,562.5	19,375	38,750	60000
11-Jun-97	9,937.5	23,187.5	33,125	66,250	79375
12-Jun-97	10,500	24,500	35,000	70,000	51875
13-Jun-97	8,250	19,250	27,500	55,000	0
14-Jun-97	12,375	28,875	41,250	82,500	81250
15-Jun-97	14,250	33,250	47,500	95,000	85625
16-Jun-97	3,750	8,750	12,500	25,000	120000
17-Jun-97	6,750	15,750	22,500	45,000	25000
18-Jun-97	7,125	16,625	23,750	47,500	55000
19-Jun-97	8,437.5	19,687.5	28,125	56,250	43750
20-Jun-97	7,500	17,500	25,000	50,000	55625
21-Jun-97	3,750	8,750	12,500	25,000	50000
22-Jun-97	1,875	4,375	6,250	12,500	0
23-Jun-97	18,750	43,750	62,500	125,000	0
24-Jun-97	11,625	27,125	38,750	77,500	104375
25-Jun-97	15,000	35,000	50,000	100,000	91250
26-Jun-97	14,625	34,125	48,750	97,500	86250
27-Jun-97	15,937.5	37,187.5	53,125	106,250	134375
28-Jun-97	3,750	8,750	12,500	25,000	87500
29-Jun-97	4,875	11,375	16,250	32,500	0
30-Jun-97	12,000	28,000	40,000	80,000	57500
Nonthly Totals	279375	651875	931250	1862500	1811250

NOTE. An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate:

16022.5 Pounds / Month

Coagulant polymer:

484.2 Pounds / Month

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month: July 1997

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Dispose (gallons/day)
01-Jul-97	13,875	32,375	46,250	92,500	82,500
02-Jul-97	14,062.5	32,812.5	46,875	93,750	76,250
03-Jul-97	27,375	63,875	91,250	182,500	75,625
04-Jul-97	4,125	9,625	13,750	27,500	141,250
05-Jul-97	750	1,750	2,500	5,000	0
06-Jul-97	7,875	18,375	26,250	52,500	0
07-Jul-97	16,125	37,625	53,750	107,500	91,250
08-Jul-97	13,312.5	31,062.5	44,375	88,750	88,125
09-Jul-97	12,750	29,750	42,500	85,000	75,625
10-Jul-97	13,500	31,500	45,000	90,000	68,750
11-Jul-97	13,875	32,375	46,250	92,500	132,500
12-Jul-97	3,750	8,750	12,500	25,000	72,500
13-Jul-97	4,687.5	10,937.5	15,625	31,250	0
14-Jul-97	10,687.5	24,937.5	35,625	71,250	71,875
15-Jul-97	19,500	45,500	65,000	130,000	103,125
16-Jul-97	14,250	33,250	47,500	95,000	89,375
17-Jul-97	14,625	34,125	48,750	97,500	78,750
18-Jul-97	15,750	36,750	52,500	105,000	132,500
19-Jul-97	4,500	10,500	15,000	30,000	85,000
20-Jul-97	4,687.5	10,937.5	15,625	31,250	0
21-Jul-97	14,625	34,125	48,750	97,500	71,875
22-Jul-97	13,125	30,625	43,750	87,500	83,125
23-Jul-97	16,687.5	38,937.5	55,625	111,250	135,000
24-Jul-97	17,250	40,250	57,500	115,000	78,125
25-Jul-97	15,750	36,750	52,500	105,000	141,250
26-Jul-97	3,750	8,750	12,500	25,000	82,500
27-Jul-97	4,875	11,375	16,250	32,500	0
28-Jul-97	12,750	29,750	42,500	85,000	77,500
29-Jul-97	12,375	28,875	41,250	82,500	75,625
30-Jul-97	16,125	37,625	53,750	107,500	76,250
31-Jul-97	16,125	37,625	53,750	107,500	131,250
Monthly Totals	373,500	871,500	1,245,000	2,490,000	2,417,500

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum Sulfate: 16487.6 Pounds / Month Coagulant Polymer: 496.3 Pounds / Month

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month: August 1997

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	
Permit Limits	30,000	70,000	100,000	200,000	
Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)
01-Aug-97	13500	31500	45000	90000	73750
02-Aug-97	5250	12250	17500	35000	80000
03-Aug-97	7125	16625	23750	47500	0
04-Aug-97	13125	30625	43750	87500	92500
05-Aug-97	12750	29750	42500	85000	78750
06-Aug-97	20250	47250	67500	135000	67500
07-Aug-97	15187.5	35437.5	50625	101250	111250
08-Aug-97	14437.5	33687.5	48125	96250	136250
09-Aug-97	5625	13125	18750	37500	81250
10-Aug-97	6000	14000	20000	40000	0
11-Aug-97	15750	36750	52500	105000	83125
12-Aug-97	13312.5	31062.5	44375	88750	92500
13-Aug-97	18562.5	43312.5	61875	123750	133750
14-Aug-97	16875	39375	56250	112500	81250
15-Aug-97	16875	39375	56250	112500	125625
16-Aug-97	4500	10500	15000	30000	78125
17-Aug-97	7500	17500	25000	50000	0
18-Aug-97	13875	32375	46250	92500	94375
19-Aug-97	17625	41125	58750	117500	83750
20-Aug-97	13312.5	31062.5	44375	88750	80625
21-Aug-97	14812.5	34562.5	49375	98750	133125
22-Aug-97	16500	38500	55000	110000	150600
23-Aug-97	2625	6125	8750	17500	63125
24-Aug-97	7125	16625	23750	47500	0
25-Aug-97	13875	32375	46250	92500	86250
26-Aug-97	16875	39375	56250	112500	78750
27-Aug-97	11775	27475	39250	78500	141250
28-Aug-97	12937.5	30187.5	43125	86250	24375
29-Aug-97	14062.5	32812.5	46875	93750	56875
30-Aug-97	7875	18375	26250	52500	119375

1875

371775

31-Aug-97

Monthly Totals

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

4375

867475

6250

1239250

12500

2478500

50000

2478100

Aluminum Sulfate: 16357.2 Pounds / Month Coagulant Polymer: 457.9 Pounds / Month

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

Jun-05-97		TSS	TVSS	TP	TN	O&G	Ammonia
		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
	Depth (m)	Aecos	Aecos	Aecos	Aecos	Aecos	Aecos
Station 1	1	1.3	0.6	0.028	0.364	<0.61	0.010
	control-1	1.3	0.9	0.016	0.207	< 0.61	0.024
	3	1.8	0.9	0.024	0.223	<0.61	0.013
	control-3	0.9	0.5	0.017	0.157	<0.61	0.033
	10	2.0	1.2	0.020	0.157	< 0.61	0.012
	control-10	2.8	1.2	0.016	0.353	<0.61	0.017
Station 2	1	0.9	0.4	0.021	0.140	<0.61	0.010
	3	1.2	0.9	0.020	0.194	< 0.61	0.022
	10	0.6	0.5	0.063	0.164	<0.61	0.026
Station 3	1	1.0	0.6	0.019	0.182	<0.61	0.021
	3	1.2	0.6	0.025	0.388	<0.61	0.098
	10	0.7	0.4	0.018	0.155	<0.61	0.023
Station 4	1	0.8	0.5	0.024	0.128	<0.61	0.012
	3	0.8	0.4	0.021	0.158	<0.61	0.010
	10	1.2	0.4	0.018	0.244	<0.61	0.012
Station 5	1	0.8	0.7	0.016	0.115	<0.61	0.007
	3	0.8	0.6	0.015	0.136	<0.61	0.003
	10	1.2	0.6	0.015	0.129	<0.61	0.005

Jul-10-97		TSS	TVSS	TP	TN	O&G	Ammonia
		mg/l⊸	mg/l	mg/l	mg/l	mg/l	mg/l
	Depth (m)	Aecos	Aecos	Aecos	Aecos	Aecos	Aecos
Station 1	1	2.8	1.2	0.036	0.366	<0.61	0.138
	control-1	0.6	0.3	0.012	0.167	<0.61	0.010
	3	3.4	1.8	0.025	0.216	<0.61	0.058
	control-3	1.4	0.3	0.012	0.145	<0.61	0.007
	10	1.3	0.5	0.017	0.202	<0.61	0.028
	control-10	1.8	0.4	0.014	0.190	<0.61	0.011
Station 2	1	0.8	0.4	0.016	0.256	< 0.61	0.022
	3	0.9	0.3	0.015	0.196	<0.61	0.014
	10	0.6	0.2	0.014	0.180	< 0.61	0.022
Station 3	1	0.8	0.4	0.013	0.172	< 0.61	0.013
	3	0.8	0.4	0.020	0.147	< 0.61	0.024
	10	1.6	0.4	0.015	0.154	<0.61	0.032
Station 4	1	1.6	0.4	0.015	0.147	< 0.61	0.014
	3	1.8	0.4	0.030	0.296	< 0.61	0.027
	10	0.6	0.2	0.025	0.118	<0.61	0.005
Station 5	1	0.6	0.2	0.060	0.192	<0.61	0.025
	3	0.8	0.2	0.047	0.150	<0.61	0.012
,	10	0.8	0.2	0.017	0.141	<0.61	0.007

TSS is reported as non-filterable residue
TVSS is reported as volatile non-filterable residue

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

Aug-07-97	Depth (m)	TSS mg/l Aecos	TVSS mg/l Aecos	TP mg/l Aecos	TN mg/l Aecos	O&G mg/l Aecos	Ammonia mg/l Aecos
Station 1	1	4.0	2.0	0.080	1.000	1.10	0.068
	control-1	3.5	1.7	0.035	0.500	0.42	0.049
	3	2.7	1.7	0.035	1.000	0.74	0.058
	control-3	3.0	2.0	0.050	1.000	0.30	0.050
	10	1.8	1.7	0.060	1.500	1.52	0.058
	control-10	2.7	1.7	0.055	0.500	1.22	0.069
Station 2	1	1.8	1.7	0.040	0.500	1.01	0.077
	3	3.7	1.7	0.065	1.000	1.09	0.123
	10	1.8	1.7	0.035	0.500	1.63	0.169
Station 3	1	3.0	2.0	0.045	0.500	1.16	0.146
	3	2.8	2.0	0.070	0.500	0.62	0.192
	10	2.7	2.0	0.065	0.500	0.61	0.082
Station 4	1	3.0	2.0	0.065	1.500	0.10	0.115
	3	2.7	2.0	0.060	1.500	0.31	0.102
	10	2.7	1.7	0.045	1.500	1.11	0.061
Station 5	1	1.8	1.7	0.060	0.500	1.41	0.120
	3	3.0	2.0	0.020	0.500	0.40	0.165
	10	2.6	1.3	0.035	0.500	0.31	0.103

TSS is reported as non-filterable residue TVSS is reported as volatile non-filterable residue

Monitoring report for at sea dumping of Starkist and Vancamps Samoa Packing tunafish cannery waste liquids.

June 5 1997

Monitoring Vessel: M/V Tasman Sea

Discharge Vessel: M/V Tasman Sea

Chief Investigator: Robert W Dennis

Starkist Liasion: Lesina

Determination of Sampling Positions: All Positions Obtained by

(GPS) Global Positioning

Satellite.

- 10:32 STATION THREE MONITORING. Standard sampling procedures were carried out and measurements recorded. Again large areas of surface sheen were present. No sea life was seen at this station.
- 10:40 STATION FOUR MONITORING. Standard sampling procedures were carried out and measurements record. The leading edge of the plume could be seen near by to the north west along with streaks of surface sheen stretching from North east to south west. Also flying fish were seen at this station.
- 10:51 STATION FIVE MONITORING. Standard sampling procedures were carried out and measurements recorded at the leading edge of the plume. Streaks of surface sheen could be seen stretching to the north east and to the south west and arrived at the boat during the sampling. A booby was flying near the boat. The weather and sea conditions remained the same as in station one during monitoring process. Monitoring operations were concluded at 11:04. The plume continued moving off to the north west as the Tasman Sea returned to Pogo Pago Harbor.

Submitted by;

Robert W Dennis

Chief Engineer M/V Tasman Sea.

SPECIAL OCEAN DUMPING RESEARCH PERMIT: OD-93-01. TABLE 1 June 5 , 1997

Weather and Sea Conditions
Overcast, drizzling and later turning to ranging squalls. Winds SE. 10 to 12 kn. later turning to 15 to 20 kn. Sea's were 3 to 6 ft., moderate chop intensifying as wind increased. Current was N by NW 2 k

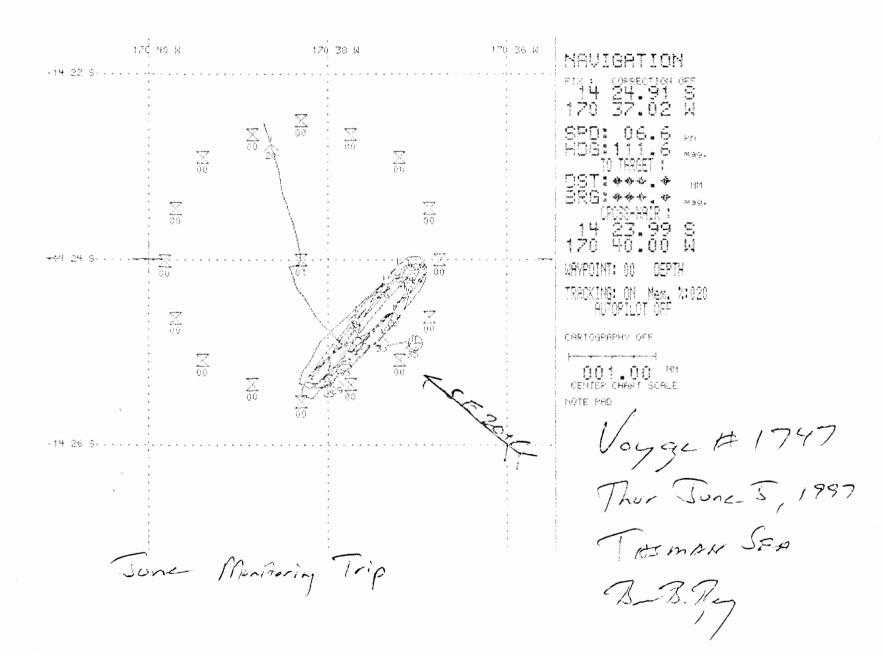
Time	Station	Depth	Temp.(*F)	рН	Odor	Color				
			79.5	8.2		Clear deep				
06:38	Control	3 m.	79	8.2	None	blue				
		10 m.	79	8.2						
		1 m.	79	8.2	Faint	Very slight				
10:19	Station 1	3 m.	79	8.2	pungent	cloudy				
		10 m.	79	8.2						
		1 m.	79	8.3	Faint	Very slight				
10:23	Station 2	Station 2	Station 2	Station 2	Station 2	3 m.	79	8.2	Pungent	cloudy
		10 m.	79	8.2						
		1 m.	79.5	8.3	Faint	Slight				
10:32	Station 3	3 m.	79.5	8.3	Pungent	cloudy				
		10 m.	79.5	8.3						
-		1 m.	79.5	8.3	Faint	Very slight				
10:40	10:40 Station 4	3 m.	79.5	8.3	Pungent	cloudy				
		10 m.	79.5	8.3						
10:51		1 m.	79.5	8.3	Faint	Clear				
	Station 5	3 m.	79.5	8.3	Pungent	blue				
		10 m.	79.5	8.3						

	Stations Positions.								
	Latitude		Longitude						
Control	14*24.0	south	170*38.3 west						
Station 1	14*25.0	south	170*37.7 west						
Station 2	14*24.7	south	170*37.8 west						
Station 3	14*24.6	south	170*37.9 west						
Station 4	14*24.4	south	170*38.0 west						
Station 5	14*24.1	south	170*38.3 west						

	**************************************		CARTOSBAPHW OFF	Housely June 5, 1997 Thursday June 5, 1997 Thesman SEN
170 36 B				
M 32 M	Ms Ms Ms D—	Kia D	AS MS MOTOR	14 25.0s 170 37.7w 14 24.7s 170 27.9w 14 24.6s 170 37.9w 14 24.4s 170 35.0w 14 24.1s 170 38.3w
M 594	Ms	 	TE DIE SOO	1013 1026 1026 1026 1035
20 de 10 de				11 # 20 P
			2 EVEVE	STATION A

June Ocean Menitering

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DUMPSITE MONITORING REPORT

10 JULY, 1997

Monitoring Vessel: M/V Tasman Sea

Discharge Vessel: M/V Tasman Sea

Chief Investigator: Mike Crook

Starkist Liaison: Lesina Sivatia

Determination of Sampling Positions: All Positions Obtained by

Global Positioning Satellite Navigator

(GPS).

INTRODUCTION

On July 10, 1997, the vessel Tasman Sea transported personnel to the designated dumpsite area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0535: Tasman Sea departed Pago Pago Harbor for the dumpsite location.
- O640: CONTROL STATION MONITORING. The Tasman Sea arrived at the dumpzone center and control seawater samples were drawn at depths on one, three, and ten meters. Temperatures, Ph, water color were all recorded in Table 1. Seas at this time were slight with an east wind of 10 kn.. Skies were partly cloudy and the barometer read 29.85. Current and drift direction were to the west with a southeast swell at 4-6'. No floating material or sealife were noted,
- 0655: The Tasman Sea began disposal operations in the eastern dumpzone quadrant and continued discharging material until 1000.
- 1010: STATION ONE MONITORING. Discrete seawater samples were drawn from depths of one, three, and ten meters. Water temperatures, Ph, stations' position and other observations were noted and recorded in Table 1. Weather conditions stayed constant with those at the time of control sampling. The plume appeared as a north to south reaching elongated area of glassy, cloudy blue with a few milky aqua patches. No floating materials or sea life were noted at this position.
- 1025: STATION TWO MONITORING. Station two was sampled with the same procedure as station one with all measurements and observations being recorded in Table 1. Weather conditions remained unchanged from Sta. #1 and no sealife or floatable materials were noted at this position.
- 1035: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1 & 2. The appearance of the plume had stayed the same as that of Station One, but with a glassy surface sheen and some fine, brownish, suspended particulate matter. The odor was only slightly pungent. No sealife was observed.

1045: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume was well dissipated at this station and the odor was still just slightly pungent. Weather conditions had not changed throughout the monitoring day and sea conditions stayed slight. No floating materials or sealife were seen.

1055: STATION FIVE MONITORING. Sampling at the leading edge of the waste plume was carried out as in previous stations. This area was no different from the surrounding deep blue colored ocean except for a few narrow streaks of glassy surface sheen. Sea, wind, and sky conditions had stayed constant throughout the day and no floatable materials were noted other than station #4. The plume was well dispersed and moving westward reaching the zone center. Monitoring activities were concluded at 1105 with the Tasman Sea returning to Pago Pago Harbor.

Submitted by:

Mike Crook

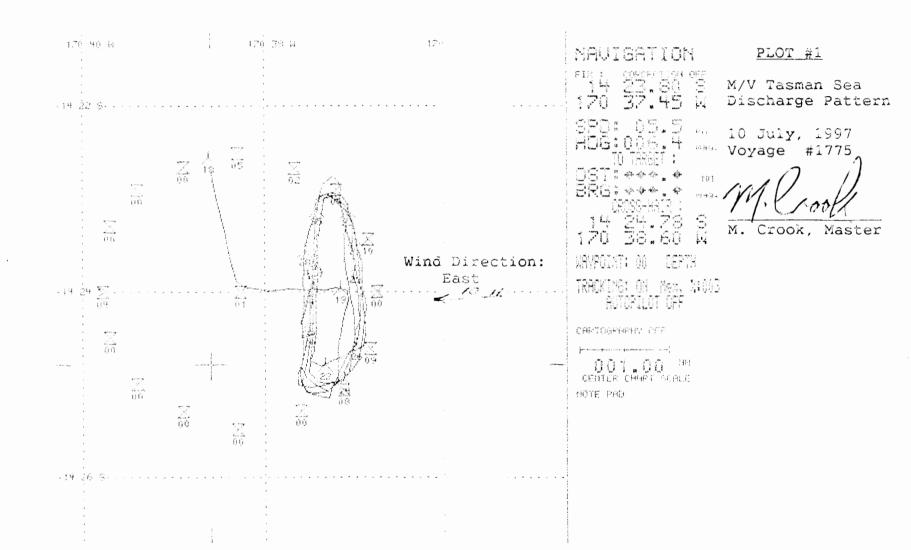
OCEAN DUMPING RESEARCH PERMIT: OD-93-02

Table 1

Date:		Sea Conditions: S	light w/ so	utheast	swells to 4	feet. Wind: Southeast to 10 km.	
10	July, 1997	Barometer: 29	9.85-29.89.	Skies:	Partly clo	oudy. Eurrent: Set to the west.	
Time	Station	Depth (meters)	Temp. (°F)	рН	Odor	Color	
		I	79.0	8.2	None	Doon clear blue	
0640	Control	3	78.0	8.2	None	Deep, clear blue.	
		10	78.0	8.3			
		1	79.0	8.3	Slightly	Cloudy blue with milky	
1010	Station 1	3	78.0	8.3	Pungent	aqua patches.	
		10	78.5	8.3	_		
		1	79.0	8.3	Slightly Pungent	Slight cloudy blue covered	
1025	Station 2	3	79.0	8.3		by a glassy surface sheen.	
		10	78.5	873			
		1	79.0	8.3	Slightly Pungent	Same as Sta.#2 w/ fine, brown,	
1035	Station 3	3	79.0	8.3		suspended particles.	
		10	79.0	8.3	- 490	suspended partitions.	
		1	78.5	8.3	011-1-1	Cliabt aloudy blue course	
1045	Station 4	3	79.0		Slightly		
	10	79.0	8.3	Pungent	by a glassy surface sheen.		
		1	79.0	8.3			
1055 Station 5	Station 5	3	79.0	8.3	Slightly		
		10	78.5	8.3	Pungent	sheen over deep, clear, (natural) b	

SAMPLE STATION POSITIONS

	Latitude	Longitude
Control	14° 23.98' South	170° 38.27' West
Station 1	14° 24.08' "	_{170°} 36.97' "
Station 2	14° 24.06' "	170° 37.27' "
Station 3	14° 24.09' "	170° 37.52' "
Station 4	14° 24.06' "	170° 37.80' "
Station 5	14° 24.04' "	170° 38.10' "



170 40 M	178	33 и	<u>i</u> 7 ij	MRUIGATION PLOT # 2 FINAL SECURITY SOCIAN MONITORING 170 38.36 SAMPLE STATIONS
\(\frac{\sum_{\text{infi}}}{\sum_{\text{infi}}}\)	X 115	₹ 02 ∑ 00 10		SFG: 11.3 kn HD6:339.3 ksp. T0 TMSET: M/V TASMAN SEA DST: ***.* km BR6: ***.* km CR688-HHR: Voyage #1775 14 24.64 S 170 37.02 M
14 24 X	57 t	<u></u>	Wind:EastCurrent Direction: West	WAYPOINT: 00 DEPTH TRACKING:OFF Nem. %:1880 AUTOPILOT OFF CARTOGRAPHY OFF
08	Z 90	08 08 08		001.00 PM CENTER CHART SCALE HOTE PAO Control Station - 01 Station #1 - 18 " #2 - 19 " #3 - 20
				" #4 - 21 " #5) - 22 Mike Crook, Chief Investigator

DUMPSITE MONITORING REPORT

07 AUGUST, 1997

Monitoring Vessel: M/V Tasman Sea

Discharge Vessel: M/V Tasman Sea

Chief Investigator: Mike Crook

Starkist Liaison: Lesina Sivatía

Determination of Sampling Positions: All Positions Obtained by

Global Positioning Satellite Navigator

(GPS).

INTRODUCTION

On August 07, 1997 the vessel Tasman Sea transported personnel to the designated dumpsite area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0540: Tasman Sea departed Pago Pago Harbor for the dumpsite location.
- O645: CONTROL STATION MONITORING. The Tasman Sea arrived at the dumpzone center and control seawater samples were drawn at depths on one, three, and ten meters. Temperatures, Ph, water color were all recorded in Table 1. Seas at this time were rough with an east wind at 20-25 mph. Skies were overcast and the barometer read 29.89. Current and drift direction were to the west with a southeast swell at 6-8'. No floating material or sealife were noted,
- 0705: The Tasman Sea began disposal operations in the eastern dumpzone quadrant and continued discharging material until 1000.
- 1015: STATION ONE MONITORING. Discrete seawater samples were drawn from depths of one, three, and ten meters. Water stations' temperatures, Ph, position and observations were noted and recorded in Table 1. Skies had cleared somewhat from the conditions at the time of control sampling but seas were still rough. The plume appeared as a north to south reaching elongated area of slight cloudy blue with a few milky aqua patches. floating materials or sea life were noted at this position.
- 1025: STATION TWO MONITORING. Station two was sampled with the same procedure as station one with all measurements and observations being recorded in Table 1. Weather conditions remained unchanged from Sta. #1 and no sealife or floatable materials were noted at this position.
- 1040: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1 & 2. The plume was generally well dispersed at this time due to the rough sea conditions and appeared as an area of slight cloudy blue. The odor was only slightly pungent. No sealife or floatable materials here.

1050: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume was well dissipated at this station and the odor was still just slightly pungent. Weather conditions had not changed from those of Station 1 and sea conditions stayed rough. No floating materials or sealife were seen.

1100: STATION FIVE MONITORING. Sampling at the leading edge of the waste plume was carried out as in previous stations. This area was hard to distinguish from the surrounding deep blue colored ocean. The plume was considered completely dispersed at this point, largely due to the rough seas. No floatable materials were noted at any of the stations. The plume had moved westward towards the zone center as it dispersed. A group of Terns and Boobies dove on a bait school nearby. Monitoring activities were concluded at 1115 with the Tasman Sea returning to Pago Pago Harbor.

Submitted by:

Mike Crook

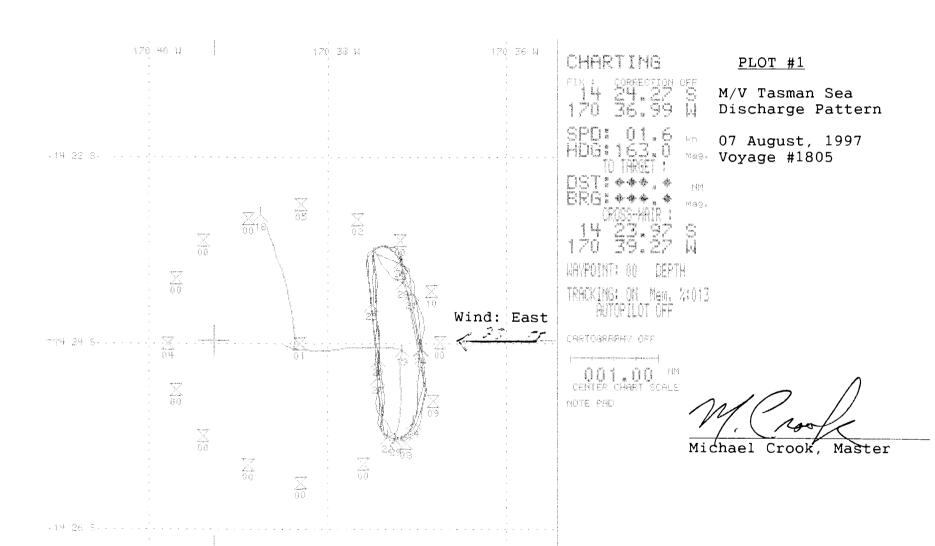
OCEAN DUMPING RESEARCH PERMIT: OD-93-02

Table 1

	August, 1997	Sea Conditions: Ro Barometer: 29				6-8 feet. Wind: Southeast 20-25 Partly cloudy.
Time	Station	Depth (meters)	Temp. (°F)	ಶಚ	Odor	Color
0645	:	T	78.0	8.2	None	Deep, clear blue
0645	Control	3	78.0	8.2	None	beep, crear bide
		10	78.0	8.3		
	-	7	78.5	8.2		
1015	Station 1	3	78.0	8.2	None	Deep, clear blue
		10	78.0	8.2	1,01.0	2002, 01011
***************************************	i	1	78.5	8.2	~ : : : : : : : : : : : : : : : : : : :	
1025	Station 2	3	79.0	8.2	Slightly Pungent	Deep, clear blue.
		10	79.0	8.2	rungent	
		į į	79.0	8.2		
1040	Station 3	3	79.0	8.2	Slightly	Very slight cloudy blue
1010		10	79.0	8.2	Pungent	
		7	79.0	8.3	07:1	
1050	Station 4	3	79.0	8.2	Slightly Pungent	Very slight cloudy blue
	1	10	78.0	8.2		
		-	79.0	8.2		Leading edge hard to distingui
1100 Station 5	Station 5	3	79.0	8.2	None	from surrounding seas' deep,
	10	78.0	8.2		clear blue.	

SAMPLE STATION POSITIONS

	Latitude	Longitu de		
Control	14° 24500' South	170° 38.32' West		
Station 1	140 24.02' 4	170° 36.94' "		
Station 2	14° 23.94' "	70° 37.22' "		
Station 3	14° 23.93' "	170° 37.43' "		
Station 4	740 24.00' "	170° 37.75' "		
Station 5	740 23.94' "	170° 38.05' "		



PLOT #2 PLOT #2 COMPANY SERVICES SAMPLING STATION OF THE PLOT #2 PLOT #2 PLOT #2 PLOT #2 PLOT #2 PLOT #2	rc.
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Current: West 101 101 101 101 101 101 101 101 101 10	
Station #1 - 18 " " #2 - 19 " " #3 - 20 " " #4 - 2	9 0 1
Mike Crook, Chief Investigate	

StarKist Samoa, Inc.



Mr. Norman Lovelace OPINAP (E-4) U.S. EPA Region 9 75 Hawthorne St. San Francisco, CA 94105

Mr. Togipa Tausaga ASEPA Office of the Governor American Samoa Government Pago Pago, American Samoa 96799



Gentlemen:

Re: OCEAN DUMPING REPORT UNDER OD-93-01

Pursuant to Special Condition 3.3 of the above referenced Ocean Dumping Permit, attached are the summary reports for the period September 1996 to November 1996.

The monthly data include all the chemical analyses for the DAF sludge, cooker water, press liquor and onshore storage tank.

All parameters were met.

Sincerely

VIRGIL SHOUSE

Manager, Cannery Manufacturing

cc:

B. Mills

P. Young

S. Wiegman

Coast Guard Liaison Officer

Project Leader - USFWS Program Officer - NMFS

Executive Director - WPRFMC

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA 102 Permit #OD 93-01

Reporting Period: From September 1996

to

November 1996

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
09-05-96	79,600	63,400	57,818	25,354	981	8,290	4,550	6.8	1.00
09-19-96	92,600	70,500	55,617	27,124	902	6,850	4,970	6.6	1.02
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	30.93 to 1.0

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
10-09-96	54,000	38,600	63,379	26,426	771	6,890	3,980	6.8	1.01
10-29-96	48,200	34,100	58,238	11,480	694	6,100	3,180	6.7	1.01
OD 93-01 Permit Limits	95,760	77,170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	0.93 to1.0

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-day Biological Oxygen Demand (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
11-15-96	34,900	20,000	43,133	6,845	632	5,850	3,490	6.51	1.03
OD 93-01 Permit Limits	95.760	77.170	105,900	52,110	3,080	13,370	7,640	6.2 to 7.3	0.93 to 1.05

Note: An asterisk (*) next to the waste concentration signifies that a violation of the permit limit has occurred.

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	
Permit Limits	30,000	70,000	100,000	200,000	

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)
09-01-96	3,750	8,750	12,500	25,000	0
09-02-96	7,312.5	17,062.5	24,375	48,750	100,000
09-03-96	14,437.5	33,687.5	48,125	96,250	64,375
09-04-96	12,187.5	28,437.5	40,625	81,250	80,625
09-05-96	15,750	36,750	52,500	105,000	123,125
09-06-96	12,375	28,875	41,250	82,500	76,250
09-07-96	7,500	17,500	25,000	50,000	80,000
09-08-96	3,562.5	8,312.5	11,875	23,750	0
09-09-96	12,750	29,750	42,500	85,000	79,375
09-10-96	17,625	41,125	58,750	117,500	133,125
09-11-96	14,062.5	32,812.5	46,875	93,750	74,375
09-12-96	17,250	40,250	57,500	115,000	133,751
09-13-96	9,562.5	22,312.5	31,875	63,750	71,875
09-14-96	12,000	28,000	40,000	80,000	43,125
09-15-96	3,562.5	8,312.5	11,875	23,750	58,750
09-16-96	11,062.5	25,812.5	36,875	73,750	56,875
09-17-96	15,000	35,000	50,000	100,000	74,375
09-18-96	11,812.5	27,562.5	39,375	78,750	78,750
09-19-96	21,607.5	50,417.5	72,025	144,050	113,125
09-20-96	10,875	25,375	36,250	72,500	46,950
09-21-96	7,500	17,500	25,000	50,000	67,500
09-22-96	9,375	21,875	31,250	62,500	0
09-23-96	12,375	28,875	41,250	82,500	95,000
09-24-96	15,562.5	36,312.5	51,875	103,750	136,875
09-25-96	16,500	38,500	55,000	110,000	70,000
09-26-96	14,250	33,250	47,500	95,000	139,375
09-27-96	12,187.5	28,437.5	40,625	81,250	59,375
09-28-96	8,625	20,125	28,750	57,500	74,375
09-29-96	5,812.5	13,562.5	19,375	38,750	0
09-30-96	12,562.5	29,312.5	41,875	83,750	84,375
Monthly Totals	348,795	813,855	1,162,650	2,325,300	2,215,701

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 10779.7 pounds / month Coagulant polymer 501.8 pounds / month

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

	DAF Sludge Generated	Cooker Juice Generated	Press Liquor Generated	Total Generated	Volume Ocean Disposed
Date	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
10-01-96	14,625	34,125	48,750	97,500	133,125
10-02-96	13,500	31,500	45,000	90,000	70,000
10-03-96	13,312.5	31,062.5	44,375	88,750	110,000
10-04-96	10,987.5	25,637.5	36,625	73,250	63,125
10-05-96	7,125	16,625	23,750	47,500	70,625
10-06-96	4,312.5	10,062.5	14,375	28,750	33,750
10-07-96	10,687.5	24,937.5	35,625	71,250	49,357
10-08-96	14,250	33,250	47,500	95,000	81,250
10-09-96	12,937.5	30,187.5	43,125	86,250	99,375
10-10-96	13,785	32,165	45,950	91,900	122,500
10-11-96	12,937.5	30,187.5	43,125	86,250	62,825
10-12-96	10,500	24,500	35,000	70,000	28,125
10-13-96	1,500	3,500	5,000	10,000	47,500
10-14-96	4,500	10,500	15,000	30,000	0
10-15-96	5,625	13,125	18,750	37,500	72,500
10-16-96	0	0	0	0	33,750
10-17-96	0	0	0	0	20,200
10-18-96	0	0	0	0	40,775
10-19-96	0	0	0	0	27,175
10-20-96	0	0	0	0	0
10-21-96	10,500	24,500	35,000	70,000	0
10-22-96	15,375	35,875	51,250	102,500	124,600
10-23-96	10,875	25,375	36,250	72,500	47,500
10-24-96	13,125	30,625	43,750	87,500	124,375
10-25-96	16,125	37,625	53,750	107,500	116,875
10-26-96	7,500	17,500	25,000	50,000	50,000
10-27-96	6,000	14,000	20,000	40,000	0
10-28-96	16,500	38,500	55,000	110,000	97,500
10-29-96	15,262.5	35,612.5	50,875	101,750	145,625
10-30-96	13,500	31,500	45,000	90,000	51,250
10-31-96	18,750	43,750	62,500	125,000	133,125
Monthly Totals	294,097.5	686,227.5	980,325	1,960,650	2,056,807

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum Sulfate: 10562.1 pounds / month Coagulant Polymer 490.0 pounds / month

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

0D 93-01	DAF Sludge Generated (gallons/day)	Cooker Water Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

	DAF Sludge Generated	Cooker Juice Generated	Press Liquor Generated	Total Generated	Volume Ocean Disposed
Date	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
11-01-96	15,937.5	37,187.5	53,125	106,250	121,875
11-02-96	9,750	22,750	32,500	65,000	70,625
11-03-96	16,125	37,625	53,750	107,500	0
11-04-96	12,562.5	29,312.5	41,875	83,750	146,250
11-05-96	14,625	34,125	48,750	97,500	71,250
11-06-96	15,375	35,875	51,250	102,500	133,125
11-07-96	11,625	27,125	38,750	77,500	134,375
11-08-96	13,500	31,500	45,000	90,000	73,125
11-09-96	7,125	16,625	23,750	47,500	59,375
11-10-96	7,500	17,500	25,000	50,000	0
11-11-96	8,250	19,250	27,500	55,000	77,500
11-12-96	11,437.5	26,687.5	38,125	76,250	111,875
11-13-96	15,112.5	35,262.5	50,375	100,750	38,750
11-14-96	15,562.5	36,312.5	51,875	103,750	95,000
11-15-96	12,187.5	28,437.5	40,625	81,250	126,875
11-16-96	11,250	26,250	37,500	75,000	75,000
11-17-96	17,625	41,125	58,750	117,500	0
11-18-96	11,812.5	27,562.5	39,375	78,750	157,500
11-19-96	16,125	37,625	53,750	107,500	87,500
11-20-96	13,875	32,375	46,250	92,500	136,250
11-21-96	17,437.5	40,687.5	58,125	116,250	116,250
11-22-96	15,375	35,875	51,250	102,500	70,625
11-23-96	3,375	7,875	11,250	22,500	91,250
11-24-96	2,812.5	6,562.5	9,375	18,750	0
11-25-96	5,625	13,125	18,750	37,500	91,875
11-26-96	8,437.5	19,687.5	28,125	56,250	32,500
11-27-96	0	0	0	0	43,125
11-28-96	375	875	1,250	2,500	0
11-29-96	11,812.5	27,562.5	39,375	78,750	0
11-30-96	3,187.5	7,437.5	10,625	21,250	38,125
11-30-90	3,107.5	7,437.5	10,625	21,250	36,125
Monthly Totals	325,800.0	760,200.0	1,086,000	2,172,000	2,200,000

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum Sulfate: 10915.0 pounds / month Coagulant Polymer 455.1 pounds / month

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

Sept 1996	Depth (m)	TSS mg/l Aecos	TVSS mg/l Aecos	TP mg/l Aecos	TN mg/l Aecos	O&G mg/l Aecos	Ammonia mg/l Aecos
Station 1	1	4.3	1.2	0.040	0.187	<0.61	0.009
	control-1	1.4	0.6	0.032	0.134	<0.61	0.007
	3	1.0	0.3	0.050	0.226	<0.61	0.013
	control-3	0.8	0.4	0.024	0.116	<0.61	0.007
	10	2.8	0.7	0.066	0.136	<0.61	0.013
	control-10	1.8	0.7	0.040	0.199	<0.61	0.010
Station 2	1	1.2	0.2	0.125	0.159	<0.61	0.015
	3	1.5	0.4	0.038	0.131	<0.61	0.007
	10	1.0	0.2	0.034	0.139	<0.61	0.005
Station 3	1	0.8	0.1	0.022	0.128	<0.61	0.006
	3	0.8	0.3	0.018	0.129	<0.61	0.005
	10	1.0	0.3	0.020	0.159	<0.61	0.005
Station 4	1	1.1	0.5	0.040	0.138	<0.61	0.005
	3	1.0	0.4	0.038	0.162	<0.61	0.006
	10	1.0	0.4	0.037	0.207	<0.61	0.011
Station 5	1	3.5	0.7	0.021	0.161	<0.61	0.006
	3	1.4	0.4	0.023	0.147	<0.61	0.005
	10	1.8	0.4	0.024	0.148	<0.61	0.004

Oct 1996	Depth (m)	TSS mg/l Aecos	TVSS mg/l Aecos	TP mg/l Aecos	TN mg/l Aecos	O&G mg/l Aecos	Ammonia mg/l Aecos
Station 1	1	1.9	1.4	0.085	1.050	<0.61	0.193
	control-1	2.0	0.6	0.016	0.117	<0.61	0.005
	3	1.6	1.0	0.036	0.354	<0.61	0.124
	control-3	1.7	0.4	0.015	0.138	<0.61	0.005
7.05	10	1.0	0.4	1.220	0.174	<0.61	0.031
	control-10	0.9	0.4	0.025	0.157	<0.61	0.005
Station 2	1	1.8	0.4	0.026	0.170	<0.61	0.010
	3	1.9	0.6	1.620	0.274	<0.61	0.023
	10	1.2	0.4	0.116	0.132	<0.61	0.009
Station 3	1	1.0	0.4	0.043	0.308	<0.61	0.083
	3	1.4	0.7	0.033	0.325	<0.61	0.133
	10	1.0	0.4	0.023	0.209	<0.61	0.060
Station 4	1	1.5	0.8	0.029	0.398	<0.61	0.123
	3	1.0	0.4	0.020	0.206	<0.61	0.053
	10	1.1	0.6	0.029	0.223	<0.61	0.053
Station 5	1	1.6	0.6	0.089	0.241	<0.61	0.013
	3	1.0	0.4	0.034	0.150	<0.61	0.006
	10	1.2	0.4	0.016	0.190	<0.61	0.011

TSS is reported as non-filterable residue
TVSS is reported as volatile non-filterable residue

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

Nov 1996	Depth (m)	TSS mg/l Aecos	TVSS mg/l Aecos	TP mg/l Aecos	TN mg/l Aecos	O&G mg/l Aecos	Ammonia mg/l Aecos
Station 1	1 1	2.2	0.6	0.030	0.206	<0.61	0.015
	control-1	2.6	0.8	0.022	0.119	<0.61	0.010
	3	1.4	0.4	0.029	0.163	<0.61	0.014
	control-3	2.4	0.8	0.025	0.153	<0.61	0.013
	10	1.0	0.4	0.025	0.144	<0.61	0.011
	control-10	1.7	0.4	0.022	0.127	<0.61	0.019
Station 2	1	2.2	1.0	0.068	0.217	<0.61	0.067
	3	1.5	0.6	0.042	0.282	<0.61	0.143
	10	1.8	0.8	0.025	0.151	<0.61	0.034
Station 3	1	1.3	0.4	0.022	0.126	<0.61	0.008
	3	1.0	0.4	0.023	0.131	<0.61	0.009
	10	1.0	0.4	0.028	0.154	<0.61	0.013
Station 4	1	1.4	0.6	0.046	0.292	<0.61	0.097
	3	1.8	0.8	0.044	0.249	<0.61	0.118
	10	2.0	0.8	0.038	0.188	<0.61	0.023
Station 5	1	1.3	0.4	0.033	0.187	<0.61	0.061
	3	1.2	0.3	0.031	0.173	<0.61	0.050
	10	1.0	0.4	0.028	0.129	<0.61	0.014

TSS is reported as non-filterable residue TVSS is reported as volatile non-filterable residue

DUMPSITE MONITORING REPORT

05 SEPTEMBER, 1996

Monitoring Vessel: M/V Tasman Sea

Discharge Vessel: M/V Tasman Sea

Chief Investigator: Mike Crook

Starkist Liaison: Lesina Sivatia

Determination of Sampling Positions: All Positions Obtained by

Global Positioning Satellite Navigator

(GPS).

INTRODUCTION

On September 05, 1996 the vessel Tasman Sea transported personnel to the designated dumpsite area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0540: Tasman Sea departed Pago Pago Harbor for the dumpsite location.
- O640: CONTROL STATION MONITORING. The Tasman Sea arrived at the dumpzone center and control seawater samples were drawn at depths on one, three, and ten meters. Temperatures, Ph, water color were all recorded in Table 1. Seas at this time were slight with an east wind of 10-15 mph. Skies were partly cloudy and the barometer read 29.83. Current and drift direction were to the west with a southeast swell at 3-5'. No floating material or sealife were noted, but a local fishing vessel was fishing nearby.
- 0705: The Tasman Sea began disposal operations in the eastern dumpzone quadrant and continued discharging material until 0945.
- 1000: STATION ONE MONITORING. Discrete seawater samples were drawn from depths of one, three, and ten meters. Water temperatures, Ph, stations' position and other observations were noted and recorded in Table 1. Weather conditions stayed constant with those at the time of control sampling. The plume appeared as a north to south reaching elongated area of cloudy blue with a few milky aqua patches. No floating materials or sea life were noted at this position.
- 1015: STATION TWO MONITORING. Station two was sampled with the same procedure as station one with all measurements and observations being recorded in Table 1. Weather conditions remained unchanged from Sta. #1 and no sealife or floatable materials were noted at this position.
- 1025: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1 & 2. The appearance of the plume had stayed the same as that of Station One, without the aqua patches, and was generally well dispersed by this time. The odor was only slightly pungent. No sealife or floatable materials.

1035:

STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume was well dissipated at this station and the odor was still just slightly pungent. Weather conditions had not changed throughout the monitoring day and sea conditions stayed slight. No floating materials or sealife were seen.

1045:

STATION FIVE MONITORING. Sampling at the leading edge of the waste plume was carried out as in previous stations. This area was no different from the surrounding deep blue colored ocean except for a narrow band of slight milky blue. Sea, wind, and sky conditions had stayed constant throughout the day and no floatable materials were noted at any of the stations. The plume was moving westward stretching towards the zone center a few Boobies lingered nearby. Monitoring activities were concluded at 1045 with the Tasman Sea returning to Pago Pago Harbor.

Submitted by:

Mike Crook

OCEAN DUMPING RESEARCH PERMIT: OD-93-02

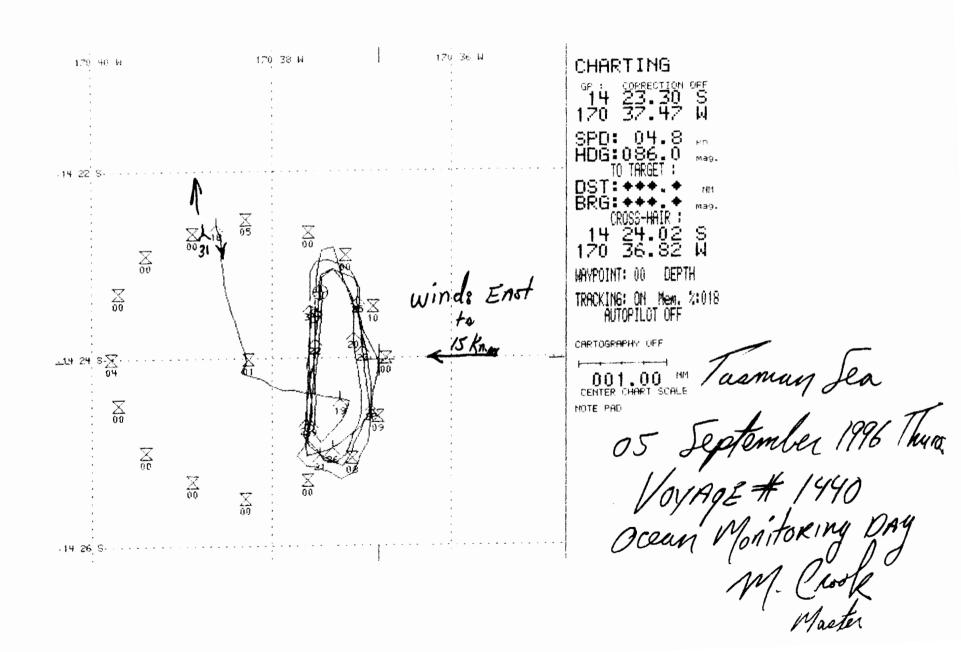
Table 1

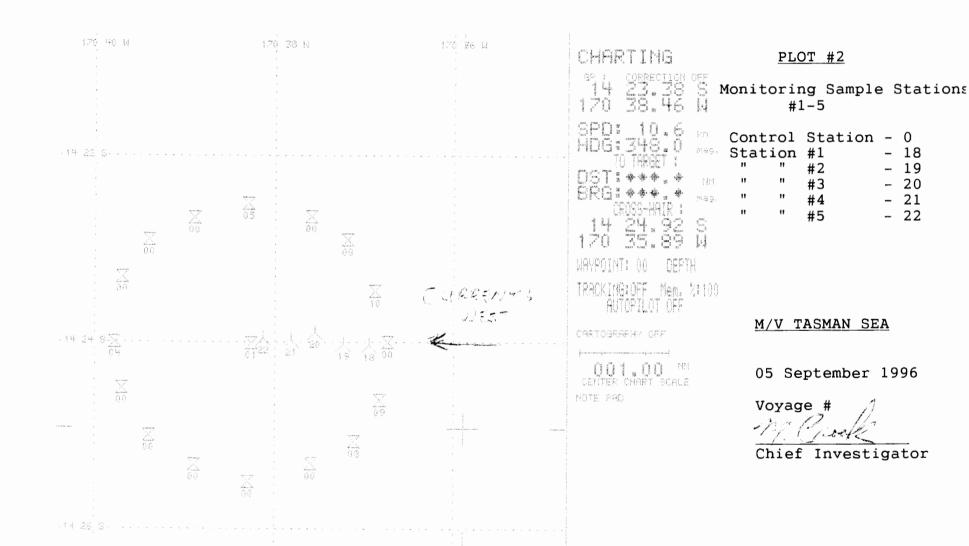
Date: 05	Sept. 199	Sea Conditions: S Barometer: 2	light w/ sc 9.83-29.85.	outheast Wind:e	swell/seas 3 asterly 10-15	3-5 feet. 5 knots w/ partly cloudy skies.
Time	Station	Depth (meters)	Temp. (°F)	рН	Odor	Color
		1	78.0	7.8		
0640	Control	3	78.0	7.9	None	Deep, clear blue
		10	78.0	7.8	and the state of t	
		1	80.0	7.8		
1000	Station 1	3	79.0	8.0	Slightly	Milky blue
		10	78.0	8.0	pungent	
	_	1	78.0	8.0		
1015	Station 2	3	78.0	8.0	Same as	Milky blue with patches
		10	78.0	8.0	Sta. #1	of cloudy aqua
		1	79.0	8.0		Well dispersed at this point,
1025	Station 3	3	79.0	8.1	Pungent	very slight cloudy blue.
		10	78.0	8.0		VC11 011g 010401 0104
		1	78.0	8.1		
1035	Station 4	3	78.0	8.1	Slightly	A few patches of very light
		10	78.0	8.0	pungent	cloudy blue (near total dispersion
1045		1	78.0	8.1		Hand to differentiate from
	Station 5	3	78.0	8.1	Same as	Hard to differentiate from surrounding natural sea:
		10	78.0	8.1	Sta.#4	(complete dispersion)

SAMPLE STATION POSITIONS

	Latitude	Longitude
Control	14°24.03' South	170° 38.36' West
Station 1	14°24.04' "	170° 36.94' "
Station 2	14024.02' "	170° 37.28' "
Station 3	14°23.92' "	170° 37.51' "
Station 4	14°23.98' "	170° 37.82' "
Station 5	14°23.96' "	170° 38.15' "

PloT #1 TASMAN SEA DISCHARGE PattERN





DUMPSITE MONITORING REPORT

OCTOBER 09, 1996

Monitoring Vessel: M/V Tasman Sea

Discharge Vessel: M/V Tasman Sea

Chief Investigator: Mike Crook

Starkist Liaison: Lesina Sivatia

Determination of Sampling Positions: All Positions Obtained by

Global Positioning Satellite Navigator

(GPS).

INTRODUCTION

On October 09, 1996, the vessel Tasman Sea transported personnel and high strength waste water to the designated dumpsite area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of said tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0530: Tasman Sea departed Pago Pago Harbor for the dumpsite location.
- O635: CONTROL STATION MONITORING. The Tasman Sea arrived at the dumpzone center and control seawater samples were drawn at depths on one, three, and ten meters. Temperatures, Ph, water color were all recorded in Table 1. Seas at this time were slight with a south southeasterly wind of 10 mph. Skies were partly cloudy and the barometer read 29.82. Current and drift direction was to the north by northwest. No floating material was noted.
- 0655: The Tasman Sea began disposal operations in the southern dumpzone quadrant and continued discharging material until 1000.
- 1010: STATION ONE MONITORING. Discrete seawater samples were drawn from depths of one, three, and ten meters. Water temperatures, Ph, stations' position and other observations were noted and recorded in Table 1. Sea, wind, and sky conditions were constant with those at the control station. The plume appeared as a west to east eliptical area of milky aqua with cloudy blue patches set in the darker blue of the surrounding ocean. Whiteish grey suspended particulate matter to 1 cm. was abundant in this area. No sealife were noted at this position.
- 1025: STATION TWO MONITORING. Station two was sampled with the same procedure as station one with all measurements and observations being recorded in Table 1. Weather conditions remained unchanged and no sealife or floatable materials were noted at this position.
- 1035: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1 & 2. The plume was a well defined eliptical area of milky aqua and cloudy blue with clear, blue, water at its' center. The odor was only slightly pungent at this position. Again no sealife or floatable materials were noted.

1050: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume was not well dispersed in this area and was mostly a slight milky blue. A few seabirds flew through this area and no floating materials were noticed.

1050: STATION FIVE MONITORING. Sampling at the leading edge of the waste plume was carried out as in previous stations, although it was difficult to distinguish it from the surrounding natural ocean. An abrupt demarcation between Station #4 and this area slightly beyond it showed that the plume was moving and dispersing quite slowly. However the Daily Discharge Log of the Tasman Sea for it's subsequent voyage approximatly 5 hours later stated there was no appearance of the previous trips' plume. So a reasonable conclusion could be drawn that the plume did go on to sink/disperse. Sea, wind, and sky conditions had stayed constant throughout the monitoring day and no floatable materials other than what was noted at Station 1 were noted. Again, no sealife was seen and at 1115 the Tasman Sea returned to Pago Pago Harbor.

Submitted by:

Mike Crook, Chief Investigator

OCEAN DUMPING RESEARCH PERMIT: OD-93-02

Table 1

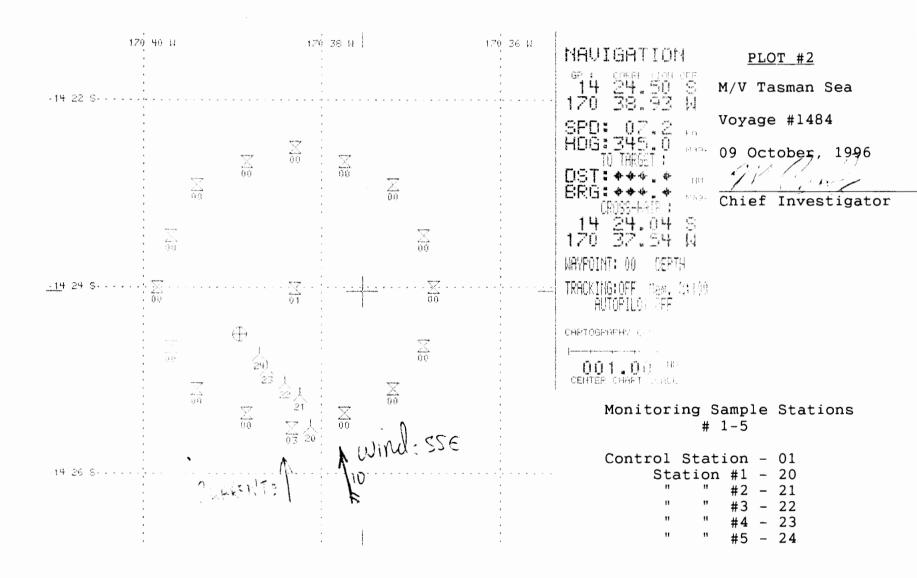
Date: 09	Oct 1996	er,			, Wind:	Southeast to	7 knots. Seas; 3-4 ft SE swell.
	1 3 3 0		Barometer: 29				y w/ Cumulus clouds.
Time		tion	Depth (meters)	Temp. (°F)	pН	Odor	Color
			1	80.0	8.0		
0635	Cor)!	3	80.0	8.0	None	Deep, Clear, Blue.
			10	80.0	8.1		:
			1	79.0	8.0	01:-1-1	
1010	Stat	1 1	3	80.0	8.0	Slightly	Milky Aqua w/ Grey-White suspen
	1		10	80.0	8.0	Pungent	particulate material to 1 cm.
			1	80.0	8.0		
1025	Stat	ι 2	3	80.0	8.0	Sligh t ly Pungent	Deep, Clear, Blue
	<u> </u>		10	80.0	8.0	rungent	
			1	80.0	8.0	C1:-b+1	Millon Dane of alimbt
1035	Sta	13	3	80.0	8.0	Slightly Pungent	Milky Aqua w/ slight Surface sheen.
			10	80.0	8.0	Fungent	Surface sheen.
			Ţ	80.0	8.0	C1:1	
1050	Sta	14	3	80.0	8.0	Slightly Pungent	Slight, Milky Aqua
			10	80.0	8.0	rungent	
	T -		1	80.0	8.1		Deep, Clear, Blue. No Sheen.
1100	Sta	ι 5	3	80.0	8.1	Slightly	Difficult to Distinguish
			10	80.0	8.1	Pungent	Plume's Leading Edge

SAMPLE STATION POSITIONS

	Latitude	Longitude
Control	14° 24.00' South	170° 38.28' West
Station 1	14° 25.50' "	170° 38.14' "
Station 2	14° 25.16' "	170° 38.25' "
Station 3	14° 25.03' "	170° 38.41' "
Station 4	14° 24.87' "	170° 38.62' "
Station 5	14° 24.72' "	170° 38.70' "

Plon #1 ASMAN SER LINSCHASE POOL

12u	40 M	170 3	Э Ы	al appear	170 36 W	CHARTING SP : CORRECTION OFF 14 24.79 S
14 23 6	X 000	\(\sum_{00} \) \(\sum_{00} \) \(\sum_{00} \)	X 000 X 000			170 37.74 W SPD: 01.9 kn HDG:055.0 mag. TO TARGET: DST:+++.+ MM
-14 24 5	90 X 90			X 00 00		CROSS-HAIR: 14 24.38 S 170 36.44 W WAYPOINT: 00 DEPTH TRACKING: ON Mem. 2:010
- Annuagement	X 00	201243		× 00	: : :	AUTOPILOT OFF CHRTOGRAPHY OFF DO1.00 NM CENTER CHART SCALE
-14 26 S	X 90	Wind:	10			09 October, 1996 Voyage# 1484 1
			Þ	1	:	Montoing DAY



DUMPSITE MONITORING REPORT

15 NOVEMBER, 1996

Monitoring Vessel: M/V Tasman Sea

Discharge Vessel: M/V Tasman Sea

Chief Investigator: Mike Crook

Starkist Liaison: Lesina Sivatia

Determination of Sampling Positions: All Positions Obtained by

Global Positioning Satellite Navigator

(GPS).

INTRODUCTION

On November 15, 1996 the vessel Tasman Sea transported personnel to the designated dumpsite area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0530: Tasman Sea departed Pago Pago Harbor for the dumpsite location.
- O635: CONTROL STATION MONITORING. The Tasman Sea arrived at the dumpzone center and control seawater samples were drawn at depths on one, three, and ten meters. Temperatures, Ph, water color were all recorded in Table 1. Seas at this time were slight with an east southeast wind of 10 mph. Skies were partly cloudy and the barometer read 29.82. Current and drift direction were to the west with an east southeast swell at 2-3'. No floating material or sealife were seen,
- O645: The Tasman Sea began disposal operations in the eastern dumpzone quadrant and continued discharging material until 0940.
- 0950: STATION ONE MONITORING. Discrete seawater samples were drawn from depths of one, three, and ten meters. Water temperatures, Ph, stations' position and other observations were noted and recorded in Table 1. Weather conditions stayed constant with those at the time of control sampling. The plume appeared as a north to south reaching array of glassy track lines with a few cloudy blue and milky aqua patches. No floating materials or sea life were noted at this position.
- 1000: STATION TWO MONITORING. Station two was sampled with the same procedure as station one with all measurements and observations being recorded in Table 1. Weather conditions remained unchanged from Sta. #1 and no sealife or floatable materials were noted at this position.
- 1015: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1 & 2. The appearance of the plume had stayed the same as that of Station One, with just a few milky blue patches, and was generally well dispersed by this time. The odor was only slightly pungent. No sealife or floatable materials.

1025: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume was well dissipated at this station and the odor was still just slightly pungent. Weather conditions had not changed throughout the monitoring day and sea conditions stayed slight. No floating materials or sealife were seen.

1040: STATION FIVE MONITORING/SUMMARY. Sampling at the leading edge of the waste plume was carried out as in previous stations. This area was no different from the surrounding deep blue colored ocean except for the glassy surface sheen. Sea, wind, and sky conditions had stayed constant throughout the day and no floatable or suspended materials were noted at any of the stations. The plume was moving westward and dispersing well with the leading edge reaching the zone center. Monitoring activities were concluded at 1050 with the Tasman Sea returning to Pago Pago Harbor.

Submitted by:

Mike Crook

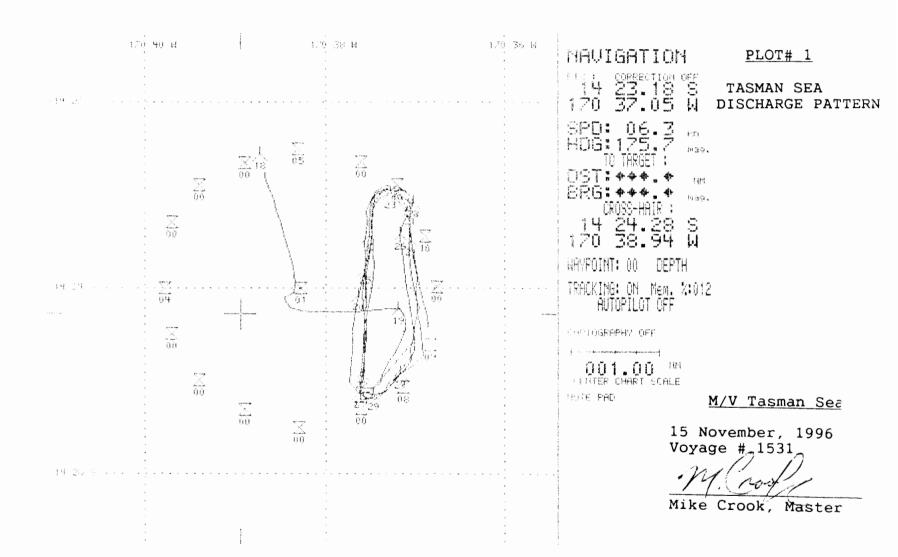
OCEAN DUMPING RESEARCH PERMIT: OD-93-02

Table 1

Date: 15	Nov. 1996	Sea Conditions: S: Barometer: 29	light. Wind 9.82-29.85.	: East/S Skies;	Southeast to Partly cloud	10kn. Seas; East/SE 2-3 feet. Ty with visibility 15 plus mile				
Time	Station	Depth (meters)	Temp. (°F)	pН	Odor	Color				
		1	82.0	8.4						
0635	Control	3	82.0	8.4	None	Deep, Clear, Blue				
		10	82.0	8.4						
		1	82.0	8.3						
0950 Station 1		3	82.0	8.4	None	Deep, Clear, Blue w/ Glassy Surface Sheen				
		10	82.0	8.4						
		1	82.5	8.4	Slightly	Milky Aqua w/ Glassy				
1000	Station 2	3	82.0	8.4	Pungent	Surface Sheen				
		10	82.0	8.4						
		1	82.0	8.4	Slightly	Glassy Surface Sheen over				
1015	Station 3	3	82.0	8.4	Pungent	Slight, Cloudy, Blue				
		10	82.0	8.4						
		1	82.5	8.4	Slightly					
1025	Station 4	3	82.5	8.4	Pungent	Same as Station #3				
1023		10	82.5	8.4	3,					
		1	83.0	8.4		0.00				
1040	Station 5	3	83.0	8.3	Pungent	Surface Sheen over Clear, Natural, Blue Sea Color.				
		10	82.5	8.3		Natural, Blue Sea Color.				

SAMPLE STATION POSITIONS

	Latitude	Longitude
Control	14° 24.06' South	170° 38.35' West
Station 1	14° 24.04' "	170° 36.93' "
Station 2	14° 24.06' "	170° 37.20' "
Station 3	14° 24.00' "	170° 37 . 47' "
Station 4	14° 24.01' "	170° 37.75' "
Station 5	14° 23.94' "	170° 38.33' "





June 21, 1995

Mr. Norman Lovelace OPINAP (E-4) U.S. EPA Region 9 75 Hawthorne St. San Francisco, CA 94105

Mr. Togipa Tausaga ASEPA Office of the Governor American Samoa Government Pago Pago, American Samoa 96799

Gentlemen:

Re: OCEAN DUMPING REPORT UNDER OD-93-01

Pursuant to Special Condition 3.3 of the above referenced Ocean dumping permit, attached are the summary reports for the period March to May 1995.

The monthly data include all the chemical analyses for the DAF sludge, cooker water, press liquor and onshore storage tank.

All parameters were met, except for the following:

- a. Total Solids, for DAF for the month of March 1995.
- b. Total Volatile Solids for DAF for the month of March and the COOKER JUICE for the month of May 1995.
- c. pH for DAF for the month of March 1995.

Sincerely,

WIRGIL SHOUSE

Manager, Cannery Manufacturing

cc:

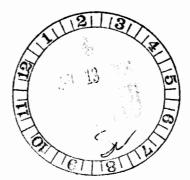
B. Mills

P. Young

S. Wiegman

Coast Guard Liaison Officer Project Leader - USFWS Program Officer - NMFS

Executive Director - WPRFMC



Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA § 102 Permit #OD 93-01

Reporting Period: From ____March______1995__To ___May______1995__

StarKist Samoa - Dissolved Air Flotation (DAF) Sludge

Month & Year	Total Solid (mg/L)		Total Vola Solids (mg/L)		5-Day Biological Oxygen Demand (mg/L)	 Oil and Grease (mg/L)	Total Phospho (mg/L)	rus	Total Nitroge (mg/L)	n	Ammoni (mg/L)	 pH (pH unit	ts)	Density (g/mL)	
3-03-95	181,000	*	159,000	*	120,400	51,806	395		3390		142	5.2	*	1.02	
4-07-95	85,600		70,600		76,912	24,776	722		3450		164	5.5		0.98	
5-02 05	132,000		111,000		44,373	51,579	1190		1710		138	5.3		0.99	
OD 93-01 Permit Limits	163,430	1	136,180	0	232,320	64,100	1,640		7,020		1,830	5.3 to 7	.0	0.97 to 1.	.06

StarKist Samoa - Cooker Juice

Month & Year	Total Solid (mg/L)	ls	Total Vola Solids (mg/L)		5-Day Biologica Oxygen Deman (mg/L)	Oil and Grease (mg/L)		orus	Total Nitroge (mg/L)	n	Ammoni (mg/L)	pII (pH unit	s)	Density (g/mL)	
3-03-95	35,300		15,700		54,248	 1320	504		4,600		257	5.9		1.01	
4-07-95	26,700		15,200		40,935	1876	236		1540		190	6.0		1.00	
5-03-95	91,600		64,800	*	53,862	11,023	801		6140		276	5.9		1.01	
OD 93-01 Permit Limits	114,180		63,400		185,150	11,810	940		7,560		690	5.9 to 7.	0	0.98 to 1.0)6

StarKist Samoa -Press Liquor

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (ntg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pII (pII units)	Density (g/mL)
3-03-95	73,800	47,700	189,646	24,100	995	7480	586	6.0	1.02
4-07-95	186,000	132,000	177,835	77,250	1390	4690	253	5.9	1.04
5-03-95	186, 000	156,000	250,500	54,917	1830	9680	578	5.9	1.02
OD 93-01 Permit Limits	327,870	292,280	310,790	112,080	3,160	20,360	1,390	5.8 to 7.0	0.99 to 1.08

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA § 102 Permit #OD 93-01

Reporting Period: From	March	1995 To	May	1995
 On Chara Starage Tank				

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pII (pH units)	Density (g/mL)
3-03-95	53,600	38,600	106,856	39,360	933	4500	3650	6.3	1.00
3-11-95	117,000	84,100	94,628	36,286	3830	4370	3720	6.2	1.01
OD 93 - 01 Permit Limit									

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pII (pII units)	Density (g/mL)
4-07-95	61,100	39,300	93,505	40,968	3100	2820	2290	6.4	1.00
4-13-95	27,300	20,700	50,893	17,648	361	1790	1560	6.6	0.99
OD 93-01 Permit Limits									

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
5-03-95	79,300	60,300	136,750	31,841	1400	6390	434	6.3	1.00
5-10-95	46,400	33,600	111,611	16,791	666	4820	4050	6.6	1.00
OD 93-01 Permit Limits									

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month March 1995

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
3- 1-95	18810	43890	62700	125400	150000	
3-2-95	18000	42000	60000	120000	75000	
3-3-95	15660	36540	52200	104400	130000	
3-4-95	10500	0	24500	35000	80000	
3-5-95	15390	35910	0	51300	0	
3-6-95	17160	40040	57200	114400	75000	
3-7-95	19500	45500	65000	130000	145000	
3-8-95	19410	45290	64700	129400	80000	
3-9-95	17070	39830	56900	113800	155000	
3-10-95	18480	43120	61600	123200	85000	
3-11-95	7200	0	16800	24000	85000	
3-12-95	15000	35000	0	50000	0	
3-13-95	18660	43540	62200	124400	140000	
3-14-95	21540	50260	71800	143600	80000	
3-15-95	23910	55790	79700	159400	180000	
3-16-95	19500	45500	65000	130000	155000	
3-17-95	15630	36470	52100	104200	170000	

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
3-18-95	8280	0	19320	27600	85000	
3-19-95	14790	34510	0	49300	0	
3-20-95	16080	37520	53600	107200	65000	
3-21-95	18375	42875	61250	122500	210000	
3-22-95	16890	39410	56300	112600	160000	
3-23-95	20820	48580	69400	138800	200000	
3-24-95	16980	39620	56600	113200	75000	
3-25-95	9900	0	23100	33000	0	
3-26-95	17220	40180	0	57400	0	
3-27-95	15188	35438	50625	101250	160000	
3-28-95	23535	54915	78450	156900	90000	
3-29-95	17535	40915	58450	116900	165000	
3-30-95	20910	48790	69700	139400	85000	
3-31-95	10598	24728	35325	70650	155000	
Monthly Totals	518,521	112,6161	1,484,520	3,129,200	3390000	

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 25,722 pounds/month

Coagulant polymer: 750 pounds/month

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month April 1995

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
4-01-95	6660	15540	22200	44400	85000	
4-02-95	12847.5	29977.5	42825	85650	0	
4-03-95	9097.5	21227.5	30325	60650	80000	
4-04-95	12847.5	29977.5	42825	85650	56000	
4-05-95	15285	35665	50950	101900	70000	
4-06-95	16410	38290	54700	109400	140000	
4-07-95	10410	24290	34700	69400	85000	
4-08-95	3750	8750	12500	25000	85000	
4-09-95	4785	11165	15950	31900	0	
4-10-95	12660	29540	42200	84400	70000	
4-11-95	8242.5	19232.5	27475	54950	40000	
4-12-95	19455	45395	64850	129700	135000	
4-13-95	6472.5	15102.5	21575	43150	95000	
4-14-95	3562.5	8312.5	11875	23750	50000	
4-15-95	0	0	0	0	0	
4-16-95	0	0	0	0	0	
4-17-95	0	0	0	0	0	
4-18-95	0	0	0	0	0	
4-19-95	0	0	0	0	0	

Date	DAF Sludge Generated (gallons/day)	.oker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
4-20-95	9187.5	21437.5	30625	61250	35000	
4-21-95	13425	31325	44750	89500	110000	
4-22-95	8610	20090	28700	57400	55000	
4-23-95	13485	31465	44950	89900	0	
4-24-95	12772.5	29802.5	42575	85150	33000	
4-25-95	14550	339.50	48500	97000	75000	
4-26-95	17317.5	40407.5	57725	115450	130000	
4-27-95	16140	37660	53800	107600	78000	
4-28-95	13125	30625	43750	87500	85000	
4-29-95	7140	16660	23800	47600	95000	
4-30-95	13125	30625	43750	87500	0	
Monthly Totals	281,363	656,513	937,875	1,875,750	1,687,000	

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 15844 pounds / month

Coagulant polymer: 520 pounds / polymer

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month May 1995

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
5-01-95	13222.5	30852.5	44075	88150	85000	
5-02-95	13785	32165	45950	91900	70000	
5-03-95	10785	25165	35950	71900	125000	
5-04-95	18330	42770	61100	122200	68000	
5-05-95	12660	29540	42200	84400	146000	
5-06-95	11910	27790	39700	79400	80000	
5-07-95	5812.5	13562.5	19375	38750	0	
5-08-95	16500	38500	55000	110000	109000	
5-09-95	14625	34125	48750	97500	125000	
5-10-95	13830	32270	46100	92200	140000	
5-11-95	20910	48790	69700	139400	85000	
5-12-95	13410	31290	44700	89400	135000	
5-13-95	5910	13790	19700	39400	75000	
5-14-95	10035	23415	33450	66900	0	
5-15-95	12615	29435	42050	84100	130000	
5-16-95	23302.5	54372.5	77675	155350	75000	
5-17-95	19005	44345	63350	126700	125000	
5-18-95	25380	59220	84600	: 1444	75000	
5-19-95	14880	34720	49600	9920.	120000	

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
5-20-95	8767.5	20457.5	29225	58450	65000	
5-21-95	18615	43435	62050	124100	85000	
5-22-95	15615	36435	52050	104100	160000	
5-23-95	15990	37310	53300	106600	115000	
5-24-95	14865	34685	49550	99100	75000	
5-25-95	12660	29540	42200	84400	130000	
5-26-95	16035	37415	53450	106900	65000	
5-27-95	6000	14000	20000	40000	75000	
5-28-95	4500	10500	15000	30000	0	
5-29-95	6892.5	16082.5	22975	45950	65000	
5-30-95	16455	38395	54850	109700	50000	
5-31-95	20955	48895	69850	139700	155000	
Monthly Totals	428,445	999,705	1,428,150	2,856,300	2,846,750	

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 18170.9 pounds / month

Coagulant polymer: 526.9 pounds / polymer

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

Mar 03 1995		TSS mg/l	TVSS mg/l	TP mg/l	TN mg/l	O&G mg/l	Ammonia mg/l
	Depth (m)	Aecos	Aecos	Aecos	Aecos	Aecos	Aecos
Station 1	1	4.2	1.1	0.019	0.785	<0.61	0.142
	control-1	3.0	0.9	0.050	0.159	<0.61	0.020
	3	1.6	0.4	0.044	0.591	<0.61	0.095
	control-3	3.0	0.8	0.021	0.222	<0.61	0.014
	10	49.0	13.0	0.039	0.280	<0.61	0.058
•	control-10	3.7	0.8	0.018	0.195	<0.61	0.020
Station 2	1	1.4	0.4	0.031	0.155	<0.61	0.017
	3	4.9	1.2	0.029	0.226	<0.61	0.023
	10	2.2	0.9	0.050	0.561	<0.61	0.084
Station 3	1	19.0	4.2	0.024	0.298	<0.61	0.062
	3	2.1	0.6	0.026	0.240	<0.61	0.053
1	10	3.0	1.8	0.028	0.355	<0.61	0.062
Station 4	1	1.3	0.6	0.033	0.432	<0.61	0.105
	3	6.5	2.6	0.030	0.235	<0.61	0.063
	10 .	3.6	1.0	0.024	0.248	<0.61	0.066
Station 5	1	1.4	0.6	0.047	0.400	<0.61	0.086
	3	2.1	0.8	0.031	0.293	<0.61	0.084
	10	1.5	0.6	0.030	0.236	<0.61	0.058

Apr 07 1995		TSS mg/l	TVSS mg/l	TP mg/l	TN mg/l	O&G mg/l	Ammonia mg/l
	Depth (m)	Aecos	Aecos	Aecos	Aecos	Aecos	Aecos
Station 1	1	1.3	0.5	0.029	0.668	< 0.61	0.224
	control-1	2.8	1.1	0.030	0.303	0.8	0.128
	3	1.0	0.4	0.024	0.193	<0.61	0.155
	control-3	2.8	1.3	0.017	0.184	<0.61	0.093
	10	1.6	0.8	0.032	0.338	<0.61	0.247
	control-10	2.0	1.0	0.021	0.153	<0.61	0.083
Station 2	1	1.8	0.8	0.024	0.220	<0.61	0.191
	3	2.0	0.6	0.016	0.145	<0.61	0.125
	10	0.8	0.4	0.014	0.140	< 0.61	0.111
Station 3	1	2.2	0.8	0.027	0.268	<0.61	0.134
	3	1.8	0.9	0.029	0.268	< 0.61	0.139
	10	3.0	0.4	0.027	0.274	< 0.61	0.114
Station 4	1	14.5	10.6	0.025	0.448	47.6	0.078
	3	1.2	0.6	0.040	0.185	<0.61	0.046
	10	2.4	0.6	~		1.81	
Station 5	1	2.4	1.4	0.019	0.220	<0.61	0.036
	3	1.6	0.6	0.022	0.176	<0.61	0.047
	10	2.4	0.6	0.027	0.274	<0.61	0.058

TSS is reported as non-filterable residue
TVSS is reported as vioatile non-filterable residue

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

May 3 1995	Depth (m)	TSS mg/l Aecos	TVSS mg/l Aecos	TP mg/l Aecos	TN mg/l Aecos	O&G mg/l Aecos	Ammonia mg/l Aecos
Station 1	1	1.2	0.8	0.023	0.262	<0.61	0.016
	control-1	2.8	1.4	0.024	0.124	< 0.61	0.008
	3	2.7	0.9	0.023	0.318	< 0.61	0.038
	control-3	1.0	0.7	0.022	0.134	< 0.61	0.010
	10	4.0	1.2	0.020	0.330	< 0.61	0.032
	control-10	3.8	2.9	0.034	0.668	< 0.61	0.241
Station 2	1	3.9	3.5	0.034	0.399	< 0.61	0.013
	3	1.0	0.4	0.013	0.157	< 0.61	0.011
	10	0.6	0.6	0.014	0.127	<0.61	0.015
Station 3	1	1.4	0.4	0.019	0.157	<0.61	0.016
	3	1.1	0.4	0.021	0.173	<0.61	0.012
	10	1.8	0.5	0.037	0.262	<0.61	0.045
Station 4	1	2.6	1.0	0.026	0.195	<0.61	0.011
	3	2.4	0.6	0.024	0.167	<0.61	0.011
	10	2.0	0.5	0.017	0.141	<0.61	0.012
Station 5	1	1.4	0.7	0.075	0.484	<0.61	0.260
	3	2.3	1.2	0.062	0.345	< 0.61	0.242
	10	1.3	0.8	0.086	0.422	<0.61	0.197

TSS is reported as non-filterable residue

TVSS is reported as volatile non-filterable residue

DUMPSITE MONITORING REPORT

MARCH 3,1995

Monitoring Vessel: Tasi II

Discharge Vessel: M/V Tasman Sea

Captain-Tasi II : Mike Crook

Chief Investigator: Mike Crook

Starkist Liaison : Ola Penn

Determination of Sampling Positions: All Positions Obtained by Global Positioning Satellite Navigator (GPS).

INTRODUCTION

On March 3, 1995, the vessel Tasi II transported personnel to the designated disposal site area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the water of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0515: Tasi II departed Pago Pago Harbor for the dumpsite location.
- O620: CONTROL STATION MONITORING. The Tasi II arrived at the disposal site and control seawater samples were drawn at depths of one, three, and ten meters. Temperatures and Ph of the above samples, as well as the position of this station and other pertinent observations were all recorded in Table 1. Seas were slight with a light easterly wind of 7-10 mph and a southeast swell of 2-3'. The drift direction of the vessel during the time of sampling indicated a west southwesterly setting current. No floatable materials observed.
- 0625: The M/V Tasman Sea turned from the dump zone center and proceeded to the eastern zone sector and began dumping operations. The Tasman Sea continued discharging material until 1000.
- 1005: STATION ONE MONITORING. Discrete seawater samples were from depths of one, three, and ten meters. Water temperatures and Ph were also measured and recorded from the above depths. Sea, wind and sky conditions had remained constant since the time of the control stain. The plume laid out in a north to south direction but was moving in a west southwest direction. The general appearance of the plume was a that of a large area of milky aqua and only a slight general discoloration of the sea under the surface sheen. The odor was also slightly pungent. The position of station one was recorded, as were all subsequent station positions', in Table 1. No floatable materials observed.
- 1030: <u>STATION TWO MONITORING</u>. Station two was sampled with the same procedure as station one with all measurements and observations being recorded in Table 1. Weather conditions remained constant with no sealife or floatable material having been seen.

- STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1&2. The main plume body had dispersed into patches of milky aqua and milky blues and was moving in a west-southwesterly direction. No floating or suspended material was seen. A group of mixed terms and boobies swarmed about a school of tuna to the west of this position.
- STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume had the same appearance as at Station 3 but faded off to the west and was covered by a slight surface sheen. A dolphin fish (Coryphena sp.) swam alongside the boat followed by a few white terns (Gygis alba). No floatable or suspended material was seen at this position.
- 1120 STATION FIVE MONITORING. Sampling at the leading edge of the plume was carried out as in previous stations. This area differed from the surrounding sea only in that it had a slight glassy sheen on the surface and a barely discernable cloudy blue appearance. A pungent odor persisted probably because of the downwind location of this station from the main plume body. Wind, sea and sky conditions had stayed constant throughout the monitoring day and no floatable or suspended material was observed. The plume continued to spread and move to the west-southwest. No birds or other sealife were noted around the leading edge of the waste plume.

Submitted by:

Mike Crook

OCKAN DUMPHIG RESEARCH PERMIT: OD-03-02

Table 1

Date:	Complete and Advisor Section Company and Section Section Co.		Sea Conditions: SLIGHT; SE Swell 2-3'											
	MARCH 3, 1	995	WIND;	EAST	ERLY 10-12 I	mph								
Time	Stallon	Depth	F	ρH	Odor	Color								
		1	83.0	8.6		DEEP, CLEAR								
0620	Control	2	83.0	8.6	NONE	BLUE								
		3	83.0	ε.7										
AND DESCRIPTION OF THE PARTY OF		1	84.0	8.6	SLIGHTLY	MILKY								
1005	Station 1	2	84.0	8.5	PUNGENT	AQUA								
1005		3	84.0	8.5										
		1	84.0	8.5	SLIGHTLY	DARK, MILKY								
1030	Station 2	2	84.C	8.5	PUNGENT	AQUA								
	<u> </u>	3	84.0	8.5		ELUE								
		1	84.0	8.5		PATCHES OF								
1050	Station 3	2	84.0	8.5	PUNGENT	MILKY AQUA &								
		3	84.0	8.5		MILKY BLUE								
		1	84.2	8.5		MILKY AQUA &								
1105	Station 4	2	84.0	8.5	PUNGENT	MILKY BLUE								
		3	83.8	8.5		PATCHES								
		1	84.2	8.5		SLIGHTLY CLOUDY								
1120	Station 5	2	84.0	6.5	PUNGENT'	BLUE W/ SURFACE								
		3	84.0	8.5		SHEEN								

Cample Station Positions

	Latitudə	Longitude	-
Control	14*24.03' South	170*38.58' West	
Station 1	14*24.79' " "	170*37.02' " "	
Station 2	14*24,87' " "	170*37.34' " "	
Station 3	14*25,36' " "	170*37.55' " "	
Station 4	14*25.55' " "	170*38.00' " "	
Station 5	14*25.66' " "	170*38.31' " "	

DUMPSITE MONITORING REPORT

8 April 1905

Monitoring Vessel: Tasi II

Discharge Vessel: M/V Tasman Sea

Captain-Tasi II : Mike Crook

Chief Investigator: Mike Crook

Starkist Liaison : 😅 🗃

Determination of Sampling Positions: All Positions Obtained by Global Positioning Satellite Navigator (GPS).

INTRODUCTION

On April 8, 1995, the vessel Tasi II transported personnel to the designated disposal site area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- O520: The Tasi II departed Pago Pago Harbor for the disposal site location.
- O645: CONTROL STATION MONITORING. The Tasi II arrived at the disposal site and seawater samples were drawn from depths of one, three, and ten meters. Temperatures and Ph of the above samples, as well as the position of this station and other pertinent observations were all recorded in Table 1. Seas were moderate with southeast winds to 15mph and seas to four feet. The drift direction of the vessel during the time of sampling indicated a west northwesterly setting current. No floatable materials were noted here.
- 0700: The M/V Tasman Sea proceeded from the dumpsite center to the southeastern quadrant of the disposal zone and began discharge operations. The Tasman Sea continued discharging material untill about 1050.
- drawn from depths of one, three, and ten meters. Water temperatures and Ph were also measured and recorded from the above depths. Sea, wind and sky conditions had remained constant from the time of the control station. The plume had laid out in a northeast to southwesterly direction and looked to be dispersing in a west to north-westerly direction. The general apperance of the plume was that of patches of light milky aqua in a larger area of darker, cloudy blue that turned to a more natural deep, clear blue off to the west-northwest. No floatable materials or sealife were observed at this station.

- 1120: STATION TWO MONITORING. Station two was sampled with the same procedure as station one with all measurements and observations being recorded in Table 1. Weather conditions remained constant with no sealife or floatable materials noted.
- 1130: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1&2. The main plume body here had the same general apperance as at station 2 but was noticably more dispersed to the west of this location. Again, no floatable material or sealife was seen at this station.
- 1138: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume at this location had a high concentration of suspended and floating, brown particulate matter which was collected in the sample bottles for depths of one and three meters. The overall apperance of the plume in this area, however, had faded to a slightly cloudy blue. A flock of assorted terns and Boobies chased a school of skipjack tuna into the plume near the Station 4 location.
- 1147: STATION FIVE MONITORING. Sampling at the leading edge of the plume was carried out as in previous stations. No more suspended material was seen at this location which differed from the natural ocean's color only in that it was covered by a glassy surface sheen. Wind, sea, and sky conditions had stayed constant throughout the monitoring day. The plume continued to drift in a west-northwesterly direction and the birds noted at station 4 had moved out of the plume and off to the southwest.

Submitted_by:

Mike Crook

OCEAN DUMPING RESEARCH PERMIT: OD-83-02

Table 1

Date:			Sea Cor	ditions	:Moderate S	eas
!	08 April	1995	Wine	d:Sout	heast to 15	mph/ Clear Skies
Time	Station	Depth	F	рН	Odor	Color
		1	83.8	8.3		Deep, Clear
0645	Control	2	83.5	8.3	None	Blue Blue
1		3	8,3.5	8.2		
	1	1	84.0	8.3	Slightly	Slight
1105	Station 1	2	84.0	8.4	Pungent	Cloudy
		3	83.8	8.4		Blue
		1	84.0	2.4	Slightly	Cloudy
1120	Station 2	2	84.0	8.4	Pungent	Blue
	1	3	84.0	8.4		
İ	•	1	83.8			Milky
1130	Station 3	2	83.8	8.3	Pungent	Aqua
		3	83.8	8.4		
		1	83.8			Cloudy Plue water w/
1138	Station 4	2	83.8	8.3	Pungent	Suspended, particulate
		3	83.8	8.5		brown matter & surface
		1	84.0	8.4		Surface scum
1147	Station 5	2	24.0		Pungent	Sheen over
	!	3	84.0	8.5		Deep, Clear, Blue.

Sample Station Positions

	Latitude	Longitude
Control	14*23.79' South	170*38.34' West
Station 1	14*24.35' " "	170*37.54' " "
Station 2	14*24.42" " "	170*37.74' " "
Station 3	14*24.47' " "	170*37.91' " "
Station 4	14*24.43' " "	170*38.08' " "
Station 5	14*24.52' " "	170*38.35' " "

DUMPSITE MONITORING REPORT

Monitoring Vessel: Tasi II

Discharge Vessel: M/V Tasman Sea

Captain-Tasi II : Mike Crook

Chief Investigator: Mike Crook

Starkist Liaison : Ola Penn

Determination of Sampling Positions: All Positions Obtained by Global Positioning Satellite Navigator (GPS).

INTRODUCTION

On May 3, 1995, the vessel Tasi II transported personnel to the designated disposal site area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- O515: The Tasi II departed Pago Pago Harbor for the dumpsite location.
- O620: CONTROL STATION MONITORING. The Tasi II arrived at the disposal site and control seawater samples were drawn at depths of one, three, and ten meters. Temperatures and Ph of the above samples, as well as the stations' position and other pertinent observations (water color and odor) were all recorded in Table 1. The sea was glassy calm with no measureable wind. The sky was partly cloudy (50% coverage). There was no significant drift direction of the Tasi II during the time of sample collection.
- O630: The M/V Tasman Sea arrived at the disposal zone center then proceeded to the southeast zone quadrant and began disposal operations. At about O650 the Tasman Sea shifted operations to the western zone sector where it continued discharging material untill 1005.
- 1010: STATION ONE MONITORING. Discrete seawater samples were drawn from depths of one, three and ten meters. Seawater temperatures and Ph were also recorded from the above depths. Sea, wind, and sky conditions had remained constant since the time of the Control Station. The plume laid out in a north to south direction and was more or less stationary. The plume was rapidly dispersing and consisted of only a few prominent light, milky aqua patches in a larger area of slightly cloudy blue, covered by a glassy sheen. No floating or suspended material was noted at this position, which was recorded in Table 1.
- 1020: STATION TWO MONITORING. Station two was sampled with the same procedure as Station One with all measurements and observations being recorded in Table 1. A fine, whiteish suspended material was noted and seemed to be well concentrated in this area. No sealife had been seen so far this trip other than an occasional seabird.

1032: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1&2 The main plume body had remained stationary with respect to its original position but appeared to be dispersing outward in all directions. No floating or suspended material or any sealife was noted here.

1040: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume had the same appearance as at Station 3 with the addition of fine, brown, floating particulate matter.

of the plume was carried out as in previous stations. Although this areas' color was nearly a natural deep, clear blue with a surface sheen it had the same brown, floating and suspended material as did Station 4. Wind, sea and sky conditions had stayed constant throughout the monitoring day. The plume remained essentially stationary and continued to spread uot and disperse in all directions. No birds or other sealife were observed around the leading edge of the waste plume.

Submitted by:

Michael Crook

OCEAN DUMP 3 RESEARCH PERMIT: OD-93-02

Table 1

Date:			Sea Cor	nditions	: Calm		1
3	May, 1995		Wind:	Calm	Sky: P/C	- 5/10	
Time	Station	Depth	F	рН	Odor	Color	j
		1	83.8	8.8		Deep, Clear]
0620	Control	2	83.8	8.8	None	Elue	
		3	83.8	8.8			
	1	1	84.0	8.5		Milky Agua	w/
1010	Station 1	2	84,0	8.5	Pungent	Surface	
		3	84.0	8.5		Sheen	
		1	83.9	8.6		Slightly C	oudy
1020	Station 2	2	83.9	8.6	Pungent	Elue w/ Su	face
		3	83.0	8.5		Sheen	
		1	84.0	8.7	Slightly		
1032	Station 3	2	84.0	8.7	Pungent	Same as #2	
		3	33.9	S.7			
1		1	84.0	8.3			
1040	Station 4	2	84.0	8.7	Same as #3	Same as #3	
		3	83.8	3.3			
		1	84.0	8.6			
1055	Station 5	2	84.0	8.7	Same as #4	Same as #4	
		3	84.0	8.8			

Sample Station Positions

	Latitude	Longitude	
Control	14*23.48' South	170*38.22' West	
Station 1	14*24.09' " "	170*38.90' " "	
Station 2	14*24.15' " "	170*39.33' " "	
Station 3	14*24.21' ""	170*39.42' " "	
Station 4	14*24.35' " "	170*39.67' " "	
Station 5	14*24.31' " "	170*40.03' " "	

April 13, 1995

Mr. Norman Lovelace OPINAP (E-4) U.S. EPA Region 9 75 Hawthorne St. San Francisco, CA 94105

Mr. Togipa Tausaga ASEPA Office of the Governor American Samoa Government Pago Pago, American Samoa 96799

Gentlemen:

Re: OCEAN DUMPING REPORT UNDER OD-93-01

Pursuant to Special Condition 3.3 of the above referenced Ocean dumping permit, attached are the summary reports for the period December 1994 to February 1995 .

2001 4/27/95

The monthly data include all the chemical analyses for the DAF sludge, cooker water, press liquor and onshore storage tank.

All parameters were met, except for the following:

- a. Oil & Grease for DAF for the month of January and February 1995
- b. Total Suspended Solids for DAF for the month of February 1995.
- c. Total Volatile Solids for DAF and Cooker Juice for the month of February 1994.
- d. ph for DAF for the month of January and February.

VIRGIL SHOUSE

Manager, Cannery Manufacturing

cc: B. Mills

P. Young

S. Wiegman

Coast Guard Liaison Officer

Project Leader - USFWS

Program Officer - NMFS

Executive Director - WPRFMC

APPENDIX B - REPORT FORM 2

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA § 102 Permit #OD 93-01

Reporting Period: From December 1994 To February 1995

StarKist Samoa - Dissolved Air Flotation (DAF) Sludge

Month & Year	Total Soli (mg/L)	ds	Total Vola Solids (mg/L)			5-Day Biological Oxygen Demand (mg/L)		Oil and Grease (mg/L)		Total Phosphorus (mg/L)		Total Nitrogen (mg/L)		ia	pH (pH units)		Density (g/mL)
12-14-94	38,100		16,400		61,883		6,586		743		1040		465		5.8		1.00
1-27-95	132,000		112,000		93,589		86,868	*	827		1,600		296		5.1	*	1.00
25-95	224000	*	205000	*	118278		102055	*	569		2180		116		4.8	*	0.98
OD 93-01 Permit Limits	163,430		136,180)	232,320		64,100		1,640		7,020		1,830		5.3 to 7	.0	0.97 to 1.06

StarKist Samoa - Cooker Juice

Month & Year	Total Solids (mg/L)		Total Volatile Solids (mg/L)		5-Day Biological Oxygen Demand (mg/L)		Oil and Grease (mg/L)		Total Phosphorus (mg/L)		Total Nitrog (mg/L)	en	Ammon (mg/L)	pH (pH units)		Density (g/mL)	
12-14-94	74,600		55,100		68,346		10,796		878		6,770		245	6.2		1.02	
1-27-95	69,000		48,500		45,318		4,245		814		5,620		334	6.0		1.01	
2-25-95	89900		70900	*	70051		9845		801		4970		324	5.9		1.01	
OD 93-01 Permit Limits	114,180		63,400		185,150		11,810		940		7,560		690	 5.9 to 7	.0	0.98 to 1.	.06

StarKist Samoa - Press Liquor

Month & Year	Total Solids (mg/L)	Total Volatile Solids (mg/L)	5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus	s Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)	
12-14-94	193,000	160,000	188,750	94,879	1,850	10,650	270	6.1	1.03	
1-27-95	263,000	233,000	140,639	85,683	3,000	2,160	399	6.1	1.04	
2-25-95	292000	251000	301000	98647	2870	11600	367	6.0	1.02	

APPENDIX B - REPORT FORM 2

Data Form for 3-Month Report on Waste Stream Analyses for StarKist Samoa MPRSA § 102 Permit #OD 93-01

Reporting Period: From December 1994 To February 1995

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids Solids (mg/L) (mg/L)		5-Day Biological Oxygen Demand (mg/L)	Oil and Grease (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)	Ammonia (mg/L)	pH (pH units)	Density (g/mL)
12-14-94	88,900	63,200	99,026	30,084	1,180	5,060	3,390	6.1	1.03
12-21-94	137,000	113,000	100,911	61,901	1,110	2,370	295	5.4	1.00
OD 93-01 Permit Limits									

StarKist Samoa - On Shore Storage Tank

Month & Year	Total Solids (mg/L)	Total Volatii Solids (mg/L)	e 5-Day Biologic Oxygen Demai (mg/L)		Total Phosphorus (mg/L)		Total Nitro (mg/L)	Total Nitrogen (mg/L)		ia)	pH (pH units)		Density (g/mL)	
1-27-95	60,800	44,000	74,889	25,340	789		4,100		4,800		6.4		1.01	
1-31-95	64000	44700	82,339	22,721	1110		6660		5160		6.9		1.01	
OD 93-01 Permit Limits														

rKist Samoa - On Shore Storage Tank

Month & Year	Total Volatile Solids (mg/L) (mg/L) Total Volatile (mg/L)			5-Day Biological Oxygen Demand (mg/L) Oil and Greating (mg/L)		Total Phosphorus (mg/L)		Total Nitrogen (mg/L)		Ammonia (mg/L)		pH (pH units)		Density (g/mL)		
2-25-95	64300	49400		95139		56793	997		6660		5170		6.8	·	0.99	
3-2-95	56300	40700		101978		50204	612		3940		3330		6.44		1.01	

Cumulative Yearly Data on Fish Processing Wastes Generated at StarKist Samoa's Plant and Disposed at the Ocean Site. MPRSA §102 Special Permit #OD 93-01

Reporting Period: From March 1994 To February 1995

Month & Year	DAF Sludge Generated (gallons/month)	Cooker Water Generated (gallons/month)	Press Liquor Generated (gallons/month)	Total Generated (gallons/month)	Aluminum sulfate (pounds/month)	Coagulant polymer (pounds/month)	Volume Ocean Disposed (gallons/month)
Mar 1994	510,000	809,600	1,121,000	2,441,200	20,358	609.8	2,419,000
Apr 1994	371,200	553,900	746,700	1,671,800	18,492	560.7	1,694,000
May 1994	407,600	879,400	1,155,000	2,442,000	27,048	803.1	2,412,000
.n 1994	420,500	917,500	1,248,000	2,586,000	27,528	835.7	2,540,000
Jul 1994	333,000	718,000	1,000,000	2,276,000	21,312	853.4	2,275,000
Aug 1994	399,250	891,250	1,223,500	2,514,000	32,220	958.2	2,474,000
Sep 1994	444,450	969,050	1,344,500	2,748,000	26,768	796.1	2,715,000
Oct 1994	343,860	742,490	948,750	2,075,100	21,904	624.8	2,011,000
Nov 1994	427,310	908,740	1,202,600	2,538,650	24,636	734.9	2,525,000
Dec 1994	394,350	829,710	1,084,940	2,309,000	24,540	692.4	2,600,000
Jan 1995	356,648	788,498	1,015,805	2,160,950	24,288	728.4	1,955,000
Feb 1995	431,010	905,730	1,174,060	2,510,800	23,028	648.2	2,366,800
Cumulative Yearly Totals	4,839,178	9,913,868	13,264,855	28,273,500	292,122	8,845.7	27,986,800

E: A separate table shall be prepared for each calendar year.

* PENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month December 1994

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
12-01-94	18,060	42,140	60,200	120,400	130,000	
12-02-94	12,000	28,000	40,000	80,000	70,000	
12-03-94	7,500	0	17,500	25,000	75,000	
12-04-94	17,940	41,860	0	59,800	0	
12-05-94	15,390	35,910	51,300	102,600	80,000	
12-06-94	21,330	49,770	71,100	142,200	155,000	
12-07-94	20,640	48,160	68,800	137,600	85,000	
12-08-94	21,000	49,000	70,000	140,000	170,000	
12-09-94	18,360	42,840	61,200	122,400	135,000	
12-10-94	6,300	0	14,700	21,000	70,000	
12-11-94	14,700	34,300	0	49,000	0	
12-12-94	17,070	39,830	56,900	113,800	85,000	
12-13-94	18,660	43,540	62,200	124,400	135,000	
12-14-94	16,890	39,410	56,300	112,600	75,000	
12-15-94	18,240	42,560	60,800	121,600	155,000	
12-16-94	16,830	39,270	56,100	112,200	85,000	
12-17-94	5,850	0	13,650	19,500	90,000	
12-18-94	14,340	33,460	0	47,800	0	
12-19-94	18,570	43,330	61,900	123,800	70,000	
12-20-94	19,980	46,620	66,600	133,200	150,000	

Date	DAF Sludge Generated (gallons/day)	C. ker Juice Generated (gallons/day)	Press Liquo Generated (gallons/day	l Generate	· -	Ocean Disposed	
12-21-94	19,320	45,080	64,400	128,800	160,000		
12-22-94	20,160	47,040	67,200	134,400	140,000		
12-23-94	14,250	33,250	47,500	95,000	45,000		
12-24-94	7,110	0	16,590	23,700	75,000		
12-25-94	1,860	4,340	0	6,200	0		
12-26-94	9,600	0	0	9,600	90,000		
12-27-94	2,400	0	0	2,400	0		
12-28-94	0	0	0	0	0		
12-29-94	0	0	0	0	165,000		
12-30-94	0	0	0	0	50,000		
12-31-94	0	0	0	0	60,000		
Monthly Totals	394,350	829,710	1,084,940	2,309,000	2,600,000		

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 24,540 pounds/month

Coagulant polymer: 692.4 pounds/month

"PENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month January 1995

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquo Generated (gallons/day	Generated	Volume Ocean Disposed (gallons/day)
1-01-95	0	0	0	0	65,000
1-02-95	0	0	0	0	0
1-03-95	0	0	0	0	0
1-04-95	0	0	0	0	0
1-05-95	0	0	0	0	50,600
1-06-95	0	0	0	0	0
1-07-95	0	0	0	0	0
1-08-95	5,250	12,250	17,500	35,000	0
1-09-95	14,250	33,250	47,500	95,000	45,000
1-10-95	15,750	36,750	52,500	105,000	70,000
1-11-95	18,750	43,750	62,500	125,000	40,000
1-12-95	18,000	42,000	60,000	120,000	110,600
1-13-95	14,490	33,810	48,300	96,600	115,000
1-14-95	5,160	0	12,040	17,200	50,000
1-15-95	13,110	30,590	0	43,700	0
1-16-95	14,250	33,250	47,500	95,000	55,000
1-17-95	16,050	37,450	53,500	107,000	155,000
1-18-95	15,750	36,750	52,500	105,000	80,000
1-19-95	18,720	43,680	62,400	124,800	130,000
1-20-95	15,990	37,310	53,300	106,600	150,000

Date	DAF Sludge Generated (gallons/day)	C. Jker Juice Generated (gallons/day)	Generate	Press Liquor Generated (gallons/day)		d ıy)	Volume Ocean Disposed (gallons/day)	
1-21-95	6,420	0	14,980		21,400		75,000	
1-22-95	15,660	36,540	0		52,200		0	
1-23-95	18,480	43,120	61,600		123,200		115,000	
1-24-95	18,623	43,453	62,075		124,150		45,000	
1-25-95	21,765	50,785	72,550		145,100		150,000	
1-26-95	17,310	40,390	57,700		115,400		90,800	
1-27-95	16,650	38,850	55,500		111,000		135,000	
1-28-95	7,140	0	16,660		23,800		98,000	
1-29-95	17,520	40,880	0		58,400		0	
1-30-95	15,150	35,350	50,500		101,000		75,000	
1-31-95	16,410	38,290	54,700		109,400		55,000	
Monthly Totals	356,647	788,498	1,015,805		2,160,950		1,955,000	

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 24,288 pounds/month

Coagulant polymer: 728.4 pounds/month

APPENDIX B - REPORT FORM 1

Monthly Volumes of StarKist Samoa Fish Processing Wastes Generated Per Day and Volumes of Fish Processing Wastes Disposed at the Ocean Site

Month February 1995

OD 93-01	DAF Sludge	Cooker Water	Press Liquor	Total
	Generated	Generated	Generated	Generated
	(gallons/day)	(gallons/day)	(gallons/day)	(gallons/day)
Permit Limits	30,000	70,000	100,000	200,000

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
2-01-95	16,410	38,290	54,700	109,400	75,000	
2-02-95	15,240	35,560	50,800	101,600	115,000	
2-03-95	14,160	33,040	47,200	94,400	75,000	
2-04-95	10,980	0	25,620	36,600	85,000	
2-05-95	16,140	37,660	0	53,800	0	
2-06-95	15,750	36,750	52,500	105,000	80,000	
2-07-95	20,250	47,250	67,500	135,000	130,000	
2-08-95	24,060	56,140	80,200	160,400	75,000	
2-09-95	19,650	45,850	65,500	131,000	165,000	
2-10-95	18,990	44,310	63,300	126,600	173,200	
2-11-95	9,540	0	22,260	31,800	80,000	
2-12-95	15,300	35,700	0	51,000	0	
2-13-95	15,720	36,680	52,400	104,800	50,000	
2-14-95	18,570	43,330	61,900	123,800	153,600	
2-15-95	18,060	42,140	60,200	120,400	80,000	
2-16-95	17,490	40,810	58,300	116,600	155,000	
2-17-95	14,250	33,250	47,500	95,000	85,000	
2-18-95	8,580	0	20,020	28,600	70,000	
2-19-95	7,200	0	0	7,200	0	

Date	DAF Sludge Generated (gallons/day)	Cooker Juice Generated (gallons/day)	Press Liquor Generated (gallons/day)	Total Generated (gallons/day)	Volume Ocean Disposed (gallons/day)	
2-20-95	15,660	36,540	0	52,200	0	
2-21-95	17,310	40,390	57,700	115,400	140,000	
2-22-95	16,890	39,410	56,300	112,600	60,000	
2-23-95	16,230	37,870	54,100	108,200	135,000	
2-24-95	15,660	36,540	52,200	104,400	85,000	
2-25-95	6,540	0	15,260	21,800	70,000	
2-26-95	13,800	32,200	0	46,000	0	
2-27-95	16,500	38,500	55,000	110,000	150,000	
2-28-95	16,080	37,520	53,600	107,200	80,000	
Monthly Totals	431,010	905,730	1,174,060	2,510,800	2,366,800	

NOTE: An asterisk (*) to the right of the fish processing waste volume signifies that a violation of the permit limit has occurred. The number of violations are shown in the Monthly Totals row.

Monthly quantities of alum (aluminum sulfate) and coagulant polymer added to the fish processing waste streams:

Aluminum sulfate: 23,028 pounds/month

Coagulant polymer: 648.2 pounds/month

Starkist Samoa, Inc Ocean Dump Site Monitoring Reports

14 D	ec 94	TSS	TVSS	TP	TN	0 & G	Ammonia
	Depth (m)	mg/l Aecos	mg/l Aecos	mg/i Aecos	mg/l Aecos	mg/l Aecos	mg/l Aecos
Station 1	1	1.3	0.7	0.038	0.409	<1.0	0.147
	control-1	1.8	1.0	0.023	0.294	<1.0	0.030
	3	1.4	1.2	0.044	0.505	<1.0	0.182
	control-3	0.9	0.4	0.026	0.196	<1.0	0.011
	10	1.0	0.6	0.035	0.362	<1.0	0.112
	control-10	0.8	0.8	0.017	0.142	<1.0	0.004
Station 2	1	0.8	0.6	0.018	0.211	<1.0	0.022
	3	1.6	1.2	0.015	0.152	<1.0	0.009
	10	0.5	0.3	0.571	0.236	<1.0	0.022
Station 3	1	1.0	0.6	0.018	0.175	<1.0	0.013
	3	1.2	0.8	0.015	0.180	<1.0	0.008
	10	0.9	0.8	0.016	0.208	<1.0	0.008
Station 4	1	3.3	1.0	0.020	0.248	<1.0	0.023
	3	0.7	0.4	0.021	0.121	<1.0	0.006
	10	0.8	0.6	0.023	0.137	<1.0	0.010
Station 5	1	0.9	0.6	0.019	0.118	<1.0	0.005
	3	0.8	0.4	0.018	0.149	<1.0	0.011
	10	1.1	0.8	0.017	0.129	<1.0	0.009

TSS is reported as non-filterable residue
TVSS is reported as volatile non-filterable residue

StarKist Samoa Inc. Ocean Dump Site Monitoring Reports

27 J	an 95	TSS	TVSS	TP	TN	O&G	Ammonia
	Depth (m)	mg/l Aecos	mg/l Aecos	mg/l Aecos	mg/l Aecos	mg/l Aecos	mg/l Aecos
Station 1	1	1.0	0.3	0.039	0.281	< 0.61	0.075
	control-1	0.9	<0.1	0.013	0.135	<0.61	0.008
	3	1.8	0.6	0.023	0.202	<0.61	0.026
	control-3	2.8	0.4	0.030	0.168	<0.61	0.007
	10	1.0	0.1	0.024	0.249	<0.61	0.047
	control-10	1.3	0.2	0.024	0.132	<0.61	0.009
Station 2	1	2.0	0.9	0.035	0.362	<0.61	0.124
	3	1.6	0.6	0.097	0.346	<0.61	0.116
	10	1.3	0.7	0.032	0.248	<0.61	0.077
Station 3	1	1.8	8.0	0.032	0.299	<0.61	0.119
	3	1.4	0.6	0.028	0.270	<0.61	0.096
	10	1.6	0.4	0.032	0.286	<0.61	0.090
Station 4	1	3.6	1.4	0.039	0.260	<0.61	0.090
	3	2.4	1.0	0.047	0.267	<0.61	0.113
	10	2.1	0.8	0.040	0.326	<0.61	0.139
Station 5	1	0.7	<0.1	0.042	0.197	<0.61	0.033
	3	0.9	0.3	0.032	0.214	<0.61	0.021
	10	1.4	0.4	0.026	0.171	<0.61	0.018

TSS is reported as non-filterable residue
TVSS is reported as vioatile non-filterable residue

StarKist Samoa Inc Ocean Dump Site Monitoring Reports

25 Feb 1995	Depth (m)	TSS mg/l Aecos	TVSS mg/l Aecos	TP mg/l Aecos	TN mg/l Aecos	O&G mg/l Aecos	Ammonia mg/l Aecos
Station 1	1	3.6	1.2	0.036	0.292	< 0.61	0.132
	control-1	1.2	0.5	0.014	0.136	< 0.61	0.007
	3	1.8	0.9	0.034	0.407	< 0.61	0.179
	control-3	1.2	0.4	0.018	0.145	< 0.61	0.009
•	10	1.6	1.0	0.034	0.312	< 0.61	0.164
	control-10	5.4	1.8	0.016	0.262	< 0.61	0.029
Station 2	1	1.0	0.6	0.022	0.181	< 0.61	0.062
	3	3.5	1.0	0.021	0.168	< 0.61	0.049
	10	3.6	1.4	0.020	0.158	< 0.61	0.049
Station 3	1	0.8	0.5	0.016	0.156	< 0.61	0.020
	3	1.0	0.8	0.018	0.427	< 0.61	0.029
	10	3.2	0.9	0.019	0.618	< 0.61	0.068
Station 4	1	3.4	0.9	0.015	0.219	< 0.61	0.019
	3 .	1.0	0.5	0.015	0.252	< 0.61	0.019
	10	0.8	0.5	0.022	0.177	< 0.61	0.013
Station 5	1	1.0	0.3	0.197	0.945	< 0.61	0.524
	3	0.9	0.4	0.018	0.130	< 0.61	0.009
TCC :	10	1.0	0.3	0.015	0.132	< 0.61	0.009

TSS is reported as non-filterable residue
TVSS is reported as vioatile non-filterable residue

DUMPSITE MONITORING REPORT

14, DECEMBER, 1974

Monitoring Vessel: Tasi II

The Common Commo

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Discharge Vessel: M/V Tasman Sea

Captain-Tasi II : Mike Crook

Chief Investigator: Mike Crook

Starkist Liaison : Ola Penn

Determination of Sampling Positions: All Positions Obtained by Global Positioning Satellite Navigator (GPS).

INTRODUCTION

On December 14, 1994, the vessel Tasi II transported personnel to the designated dumpsite area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was done in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- O520: The Tasi II departed Pago Pago Harbor for the dumpsite location.
- 0625: The Tasi II arrived at the dumpsite location and control water samples were drawn at depths of one, three, and ten meters. The latitude and longitude at this, and all the following monitoring stations, were determined by GPS satellite navigation and recorded in Table 1. Temperature and Ph of the above samples were measured and also recorded in Table 1. Seas at this time were calm to slight with a slight breeze of 5 mph of less from the north-northeast. There was no odor or suspended material while the sea color was a deep, clear blue. No sealife was apparent in the dumpzone area at this time. The M/V Tasman Sea arrived at the dumpzone center at the time control samples were being drawn and then proceeded to the northerly quadrant of the dumpzone where it began pumping waste material at about 0635. The Tasman Sea continued discharging material untill 0915.
- 0920: STATION ONE MONITORING. Discrete water samples were collected at depths of 1,3, and 10 meters. The temperature and Ph of each sample was measured and recorded in Table 1 as were observations about the odor and sea color in the vicinity. Sea conditions at this time were the same as those at the time of the Control station. No birds or other sealife were noted at Station 1.
- 0930: STATION TWO MONITORING. Station 2 was sampled with the same procedure as Station 1 with all measurements and observations recorded in Table 1. Sea and weather conditions remained constant and no birds or sealife was noted in the area.

- 0940: STATION THREE MONITORING. Seawater samples were collected with measurements and observations recorded in Table 1. The cloudy nature of the seawater had cleared significantly at this point but there was however an easily visible concentration of floating and suspended, whiteish, particulate material at this station. Again, no birds or other sealife was noted at Station 3.
- 0950: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume had dissipated to the extent that it appeared as just a glassy surface sheen over the natural deep, clear, blue of the surrounding ocean. There still was, as was the case in Station 3, a high concentration of floating and suspended material measureing from about 2-7mm in size and white to light grey in color. A large flock of seabirds were noted to the north of this position, apparently feeding with a school of tuna.
- of the plume was carried out as in previous stations. the plume here was distinguished from the surrounding ocean by only a glassy sheen on its surface. There was no more particulate matter observed here. The plume in its entirety was moving roughly towards the southwest. The sea and wind conditions had remained constant from the time the control samples were taken. The flock of seabirds were still swarming over a school of tuna approximately one mile north of this position.

Submitted by:

Mike Crook, Captain/Chief Investigator

OCEAN DUMPING RESEARCH PERMIT: OD-93-02

Table 1

Date: December 14, 1994		Sea Con Wind-	ight to 5 mph			
Time	Station	Depth	F	рΗ	Odor	Color
		1	83.0	8.6		Deep, Clear
0625	Control	2	83.0	8.9	None	Blue
	1	3	83.0	8.9		
		1	83.0	9.0		Milky Aqua Patches
0920	Station 1	2	83.0	9.0	Pungent	on cloudy Blue
		3	83.0	9.1		
		1	84.0	9.1		Cloudy Blue w/
0930	Station 2	2	83.0	9.2	Pungent	Surface Sheen & Whiteish
to the control of the	Secret Contracted Statement Contracts Contract Contracts	3	83.0	9.0		suspended Particles
		1	84.0	9.1	Slightly	Surface Sheen on Deep
0940	Station 3	2	84.0	9.1	Pungent	Blue w/ Suspended
		3	84.0	9.0	ming delta savar manimika sera sara (, bd. dilian, d. sa . s s s s s s s	White Particles
0950 Station 4		1	0.53	9.3	Slightly	Surface Sheen on Deep
	Station 4	2	84.0	9.2	Pungent	Clear, Blue w/suspended
	1	3	84.0	9.3	of the fire discovery and a simple property of the source	Particles
		1	84.0	9.0	Slightly	Surface Sheen
1005	Station 5	2	84.0	9.0	Pungent	over Deep, Clear
	1	3	84.0	9.1		Plue

Sample Station Positions

	Latitu de	Longitude
Control	14*24.08' south	170*38.25' west
Station 1	14*22.98' " "	170*35.92' " "
Station 2	14*23.44' " "	170*35.69' " "
Station 3	14*23.58' " "	170*35.42' " "
Station 4	14*23.81! " "	170*35.33' " "
Station 5	14*24.15' " "	170*35.36' " "

DUMPSITE MONITORING REPORT

27 JANUARY, 1995

Monitoring Vessel: Tasi II

Discharge Vessel: M/V Tasman Sea

Captain-Tasi II : Mike Crook

Chief Investigator: Mike Crook

Starkist Liaison : Ola Penn

Determination of Sampling Positions: All Positions Obtained by Global Positioning Satellite Navigator (GPS).

INTRODUCTION

On January 27, 1995, the vessel Tasi II transported personnel to the designated disposal site area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of canerry generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0515: Tasi II departed Pago Pago Harbor for the dumpsite location.
- O620: CONTROL STATION MONITORING. The Tasi II had entered the the disposal zone and control water samples were drawn at depths of one, three and ten meters near the zone center (all sampleing positions are listed in Table 1). Temperature and Ph of the seawater samples above were measured and recorded. Seas were slight with an east-northeasterly breeze of 10-12mph. Observations on sea color, odor and floatable material will also be found in Table 1. Skies were partly cloudy and no sealife was noted in the area.
- O630: The M/V Tasman Sea arrived at the dumpzone center and proceeded to the eastern zone quadrant where it began dumping operations. The Tasman Sea continued discharging material untill 0950hrs.
- 1000: STATION ONE MONITORING. Discrete water samples were collected at depths of 1, 3, and 10 meters. Water temperatures and Ph were also measured and recorded for the above depths. Sea conditions were constant with those at the control station. No sealife was observed at station 1.
- 1010: STATION TWO MONITORING. Station 2 was sampled with the same procedure as Station 1 with all measurements and observations concerning plume color, odor and floatable material being recorded in Table 1. Again no sealife or birds were noted in the area at this time.
- 1023: STATION THREE MONITORING. Same procedures as in Stations 1 and 2, with the main plume body beginning to break up into smaller, scattered patches of milky green. The plume, at this point, was moving in a weaterly direction. No birds or other sealife was seen.

- 1031: STATION FOUR MONITORING. Standard sampling procedres were again carried out as in previous stations. The plume at this position had faded to a deep, slate green that was hard to distinguish from the surrounding sea. A few terns and Boobies cruised briefly in this area before flying off to the east.
- 1040: STATION FIVE MONITORING. Sampling at the leading edge of the plume was carried out as in previous stations. The plume, by this time, was almost completely dispersed. Preceded by a glassy sheen, the main plume body was still moving in a westerly direction. Sea, wind and sky conditions had stayed constant throughout the sampling time. No sealife was noted near the leading edge of the plume.

Submitted by:

Mike Crook

OCEAN DUMPING RESEARCH PERMIT: OD-93-02

Table 1

Date: 27	Date: 27 January, 1995 Sea Conditions: Slight Seas					
-			Wind:	North	Northeast	10-12mph
Time	Station	Depth	F	ρН	Odor	Color
		1	83	8.0		Deep,
0620	Control	2	83	7.9	None	Clear
		3	83	. 8.0	The state of the s	Blue
	Secret at shifted better to common the committee of the common of the co	1	83	8.0	Slightly	Milky
1000	Station 1	2	83	8.0	Pungent	Aqua
		3	83	8.1		
		1	83	8.0		Milky
1010	Station 2	2	83	7.9	Pungent	Green
		3	83	8.0		
		1	83	8.0		Milky
1023	Station 3	2	83	7.9	Pungent	Green
		3	83	7.8		
		1	8.3	7.9		Deep
1031	Station 4	2	83	8.2	Pungent	Slate, Green
		3	83	7.8		And the same of th
		1	83	8.0		Surface Sheer
1040	Station 5	2	83	8.0	Pungent	over Deep
		3	83	8.2		Clear, Blue

Sample Station Positions

on transcription is normalized by a second control of the second c	Latitude	Longitude
Control	19° 23 76 Seath	770 38 AV West
Station 1	14944.14	170 37.08' "
Station 2	14024-12"	172237.75
Station 3	173/037	170 38.30
Station 4	14 2442 "	170033.85
Station 5	1424.60	70:39.90

DUMPSITE MONITORING REPORT

FEBRUARY 25, 1995

Monitoring Vessel: Tasi II

Discharge Vessel: M/V Tasman Sea

Captain-Tasi II : Mike Crook

Chief Investigator: Mike Crook

Starkist Liaison : Ola Penn

Determination of Sampling Positions: All Positions Obtained by Global Positioning Satellite

Navigator (GPS).

INTRODUCTION

On February 25, 1995, the vessel Tasi II transported personnel to the designated disposal site area seven miles south of Pago Pago Harbor, American Samoa for the purpose of monitoring the disposal of tuna cannery generated liquid wastes into the waters of the Pacific Ocean. This monitoring was conducted in compliance with Appendix A of Special Ocean Dumping Permit OD 93-02.

CHRONOLOGY OF EVENTS

- 0515: Tasi II departed Pago Pago Harbor for the dumpsite location.
- O620: CONTROL STATION MONITORING. The Tasi II arrived at the disposal site and control seawater samples were drawn at depths of one, three, and ten meters. Temperatures and Ph of the above samples, as well as the position of this station and other pertinent observations were all recorded in Table 1. Seas were slight with a light easterly wind of 7-10 mph and overcast skies. The drift direction of the vessel during the time of sampling indicated a westerly setting current. A flock of seabirds were feeding to the east of the sampling location.
- O635: The M/V Tasman Sea turned from the dumpzone center and proceeded to the eastern zone sector and began dumping operations. The Tasman Sea continued discharging material untill 1030.
- 1040: STATION ONE MONITORING. Discrete seawater samples were from depths of 1,3, and 10 meters. Water temperatures and Ph were also measured and recorded from the above depths. Sea, wind and sky conditions had remained constant since the time of the control station. the plume laid out in a north to south direction but was moving in a westerly direction. The general apperance of the plume was that of a large area of glassy surface sheen, a few patches of milky aqua and only a slight general discoloration of the sea under the surface sheen. the odor was also slightly pungent. The position of station one was recorded, as were all subsequent station positions', in Table 1. No sealife or floatable materials were noted.
- 1056: STATION TWO MONITORING. Station two was sampled with the same procedures as Station One with all measurements and observations being recorded in Table 1. Weather conditions remained constant with no sealife or floatable material having been seen.

- 1106: STATION THREE MONITORING. Seawater samples were collected and measurements taken as in Stations 1 and 2. The plume had become fairly well dispersed at this time with its most obvious charactaristic being the smooth surface sheen. Again, no suspended or floating material was seen. A few white terns appeared to be following fish, probably Dolphin fish, in an area of the dispersed plume to the north of this position.
- 1114: STATION FOUR MONITORING. Standard sampling procedures were carried out as in previous stations. The plume had dissipated to the extent that from this position out to the leading edge it was only noticeable as the glassy surface sheen described earlier. The white terns, (Gygis alba) continued to chase fish in the plume remnants around the boat. As in previous stations, no suspended or floatable waste material was seen.
- of the plume was carried out as in previous stations. The only apperance that differed from the surrounding ocean here was where the smoothe surface sheen became choppy like the rest of the ocean further west of the plume area, however the pungent odor was still present, due to the downwind location of the vessel. Weather, sea and sky conditions had remained constant throughout the day and, as in all previous sample stations, no floatable or suspended waste material was noted. No birds or other sealife was seen in this area.

Mulbark

Submitted, by:

Mike crook

OCEAN DUMPING RESEARCH PERMIT: OD-93-02

Table 1

Date:	EBRUARY 2	5, 1995	Sea Conditions: SLIGHT; CURRENT: WEST Wind/ East southeast 7-10mph				
Time	Station	Depth	F	рΗ	Odor	Color	
		1	83.8	8.5		Deep, Clear	
0620 Control	Control	2	83.5	8.5	NONE	Blue	
		3	83.0	8.5	the state of the s	To any common and the common of the common and the	
		1	84.0	8.5	Slightly	Slate Green	
1040	Station 1	2	84.0	8.5	Pungent	Patches w/ 0	
		3	84.0	8.5		Surface Shee	∍n
		1	84.0	8.5	Slightly	Slightly Clo	oudy
1056 Stat	Station 2	2	84.0	8.5	Pungent	31ue w/ Suri	Eace
		3	84.0	8.5		Sheen	
STANDARD CONTRACTOR AND A STANDARD CONTRACTO		1	84.0	8.5	Slightly	Surface	
1106	Station 3	2	84.0	8.5	Pungent	Sheen	
		3	84.0	8.5			
		1	84.0	8.5		Surface	
1114	Station 4	2	84.0	8.5	Pungent	Sheen	
		3	84.C	8.5			
1125 Stat		1	84.0	8.5		Surface	
	Station 5	2	84.0	8.5	Pungent	Sheen	
		3	84.0	8.5			

Sample Station Positions

	Latitude	Longitude
Control	14*23.79' South	170*38.26' West
Station 1	14*23.35' "	170*36.81' "
Station 2	14*23.62' "	170*37.10' "
Station 3	14*23.74' "	170*37.45' "
Station 4	14*23.76' "	170*37.75' "
Station 5	14*23.79' "	170*38.02' "

Page 1 of 3

Copy to Allan Ota Mike Lee

Star-Kist Foods, Inc.

One Riverfront Place Newport, Kentucky 41071

FAX COVER PAGE

To: Pat Young		From : Norman S. Wei Company : Star-Kist Foods, Inc.						
Number of pages incli	uding this cover page : 3							
Date : 9/6/94	Time : 23:07:08	For Information Call: 606-655-5842						
		Fax Number : 606-655-5610						
Subject : Response to	August 22 letter							
Pat:								
I am in Puerto Ri	co again. But here is my res	sponse to your August 22nd letter.						
Norman								
	-							

Created using WinFax PRO 3.0 Delrina Technology Inc.

Star-Kist Foods, Inc.

Memo

DATE:

7 September 1994

TO:

Pat Young

US EPA American Samoa Program Manager

18W

FROM:

Norman S. Wei

Thank you for your letter of August 22, 1994 bringing to my attention several issues concerning StarKist Samoa's ocean disposal permit. Please accept my apologies for the delay in responding to you since I was in Puerto Rico on business when your letter arrived in Kentucky. I have since spoken with our plant personnel and the following are my findings:

- 1. The delay in filing with the agencies on the permit exceedances was due in large part to the lack of follow-up by the plant personnel to obtain the necessary signature at the plant in a timely fashion. This administrative problem has been resolved and should not recur. Another reason for the delay is the length of time taken to obtain official final analytical results from the laboratory in Hawaii. The plant personnel will be more aggressive in the future in this area.
- 2. The daily disposal logs and analyses of receiving water monitoring were mailed out to US EPA according to our plant personnel. I have asked Helen to re-submit them to you in case these data had been lost in the mail.
- 3. With respect to the manual plotting of the disposal area, our plant personnel checked with the new Captain of the Tasman Sea and was told that the printer had indeed broken down in May. The problem was fixed in June/July. The new Captain came onboard on July 15th and was learning the use of the computerized plotting equipment. He reported that for the period between mid-May and July 27th, only manual plots were available. He has since, however, mastered the equipment and all future plots from July 28th onwards should be computerized.

It seems to me that most of these problems could have been avoided through better internal communication within our plant and with the Tasman Sea captain. Our plant has also experienced several personnel changes in the past few months. These are not excuses but rather reasons for the problems.

I appreciate your bringing these problems to my attention and have so indicated to our plant personnel. They have reassured me that they will be more vigilant in this area and that these problems will not recur.

Should you have any questions, please feel free to contact me directly at (606) 655-5842.

cc: Barry Mills - StarKist Samoa Cliff Johnson - StarKist Samoa Togipa Tausaga - ASEPA Sheila Wiegman - ASEPA

c:/samoa/young.doc

StarKist Samo Jnc.

A Subsidiary of Star-Kist Foods, Inc.

P.O. Box 368

P.O. 8cx 368 Pago Pago, Tutuila Island American Samoa 96799

Telephone: 684 644-4231 Facsimile: 684 644-2440

November 7,1994

Mr. Norman Lovelace
OPINAP (E-4)
U.S. Environmental Protection
 Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

Mr. Togipa Tausaga American Samoa Environmental Quality Commission Office of the Governor American Samoa Government Pago Pago, American Samoa 96799

Gentlemen:

This is to advise you that pursuant to Condition 3.3.4 of Starkist Samoa's Ocean Dumping Permit OD 93-01 Special, the total phosphorus for the Press Liquor and the oil and grease for the Cooker Juice permitted maximum concentration were both exceeded during the month of September, 1994.

The total phosphorus concentration of the Press Liquor was 4,120 mg/l. The permitted concentration is 3,160.

The oil and grease concentration of the Cooker Juice was 13,876 mg/l. The permitted concentration is 11,810 mg/l.

All other permitted concentration were met.

Sincerely,

STARKIST SAMOA, INC.

VIRÆIL SHØUSE

Manager, Cannery Manufacturing

cc: B. Mills

C. Johnson

N. Wei

S. Wiegman

P. Young

StarKist Samo., Inc.

1 Mike Lee A Subsidiary of Star-Kist Foods, Inc.

P.O. Box 368 Pago Pago, Tutuila Island American Samoa 96799

Telephone: 684 644-4231 Facsimile: 684 644-2440 cd 9/0/94



OPINAP (E-4)
U.S. Environmental Protection
Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

Director American Samoa Environmental Quality Commission Office of the Governor American Samoa Government Pago Pago, American Samoa 96799

Gentlemen:

This is to advise you that pursuant to Condition 3.3.4 of Starkist Samoa's Ocean Dumping Permit OD-93-01, the ammonia and total volatile solids permitted maximum concentration was exceeded during the month of July, 1994 for cooker juice and press liquor respectively.

The total volatile solids concentration of the cooker juice was 74,700~mg/l. The permitted concentration is 63,400~mg/l. The ammonia concentration of the press liquor was 2,300~mg/l. The permitted concentration is 1,300~mg/l.

All other permitted concentrations were met.

Sincerely,

STARKIST SAMOA, INC.

WIRGIL SHOUSE

Manager, Cannery Manufacturing

cc: B. Mills

C. Johnson

N. Wei

S. Wiegman

P. Young

StarKist Samoa. 1:1C.

All Artificial in Frankish By observing Carry party.



ino Bro 668 Pago Pago, Tufuda Iolanes American Sumoa 96799 Telephona: 684-644-425. Facsimile: 684-644-2140 (into Allow in

August 10, 1994

OPINAP (E-4)
U.S. Environmental Protection
Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

Director
American Samoa Environmental Quality Commission
Office of the Governor
American Samoa Government
Pago Pago, American Samoa 96799

Gentlemen:

This is to advise you that pursuant to Condition 3.3.4 of Starkist Samoa's Ocean Dumping Permit OD-93-01, the oil and grease, ammonia and total volatile solids permitted maximum concentration was exceeded during the month of June, 1994 for DAF sludge and press liquor respectively.

The oil & grease concentration of the DAF sludge was 119,912 mg/l. The permitted concentration is 64,100 mg/l. The total volatile solids concentration of the DAF sludge was 141,000 mg/l. The permitted concentration is 136,180 mg/l. The ammonia concentration of the press liquor was 2,740 mg/l. The permitted concentration is 1,390 mg/l.

All other permitted concentrations were met.

Sincerely,

STARKIST SAMOA, INC.

Manager, Cannery Manufacturing

cc: B. Mills

C. Johnson

N. Wei





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION IX 75 Hawthorne Street

75 Hawthorne Street San Francisco, CA 94105

August 22, 1994

Norman Wei Senior Manager Environmental Engineering StarKist Foods, Inc. Riverfront Place Newport, KY 41071

Re: Reports Submitted for Special Ocean Disposal Permit OD 93-01

Dear Mr. Wei:

We have reviewed the reports submitted in compliance with StarKist Samoa's Ocean Disposal Permit OD 93-01 covering the period September 1993 to May 1994 and would like to bring to your attention the following:

- 1. Section 3.3.4 of the permit requires the permittee, upon detection of a violation of any permit condition, to provide written notification of the violation within 5 working days, to USEPA and ASEPA. A detailed written report of the violation should also be sent to us within 15 working days. Our review of the 9 months of data showed several exceedances of individual waste stream limits per each 3-month reporting period. However, we have no written record of us or ASEPA being notified of these exceedances nor have detailed written reports been received within the timeframes indicated in the permit. In the future, we would appreciate your adhering to this permit requirement.
- 2. We have not received the following information:
 - a) daily disposal logs of the F.V. TASMAN SEA for September 9-10, 1993 and October 1-10, 1993.
 - b) analyses of receiving water monitoring for December 1993, January and February 1994.

Please provide the missing information or an explanation as to why they were not submitted.

3. From May 10, 1994 through the end of May, the path of the disposal operations within the disposal site was plotted manually, not by the computerized navigational system's computer printer, as required by Section 4.3.4. We should be informed why the hard copy computer plots were not available, and if due to equipment failure, when it is/was expected to be fixed.

We appreciate your attention to the above matters. Should you have any questions regarding our comments, please contact me at (415) 744-1594.

Sincerely,

Pat Young

American Samoa Program Manager Office of Pacific Island and Native American Programs (E-4)

CC: Barry Mills, StarKist Samoa, Inc.
Togipa Tausaga, ASEPA
Sheila Wiegman, ASEPA
Mike Lee, E-4
Allan Ota, W-2-3



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION IX

75 Hawthorne Street San Francisco, CA 94105 November 16, 1993

MEMORANDUM

SUBJECT: Request for Review of Draft Bioassay and Modeling Re-

evaluation Plans for Tuna Cannery Ocean Disposal

Permits

TO:

Janet Hashimoto/Dave Stuart

Oceans and Estuaries Section (W-7-1)

Allan Ota

Dredging Team (W-7)

Terry Oda/Debra Denton/Robyn Stuber Permits Issuance Section (W-5-1)

Brenda Bettencourt/Amy Wagner Laboratory Support Section (P-3)

FROM:

Pat Young Host

American Samoa Program Manager (E-4)

Attached please find copies of the draft bioassay and modeling re-evaluation plans required by the canneries' reccently-issued ocean disposal permits. We would greatly appreciate your assistance in having the study plans reviewed by your appropriate staff. If additional background information is needed to assist in the review, please let me know.

Of particular note in these drafts are: 1) request for delay of sampling schedule for bioassays; 2) proposal of different organisms for bioassays; and, 3) use of an additional, more sophisticated model for the modeling re-evaluation study. I would greatly appreciate your staff's review of this draft and any comments to me by December 10th if at all possible. The first sampling for the biossay needs to be done by the end of January so that the study results will not be unduly delayed. Should the reviewer need to discuss the technical aspects of the proposal, he/she should feel free to contact Steve Costa of CH2MHill at (510) 251-2426, ext-2251. Please call me at (415) 744-1594 if you have any questions.

Thanks again for your assistance.

Enclosure

cc: Mike Lee (E-4)

pille .



November 12, 1993

PDX30702.DS.BP/.MP

Patricia N.N. Young
American Samoa Program Manager
Office of Pacific Islands and Native American Programs
U.S. Environmental Protection Agency
75 Hawthorne Street (E-4)
San Francisco, California 94105



Dear Pat:

Subject:

Draft Study Plan for Special Condition 3.3.5 Ocean Dumping Studies for

StarKist and Samoa Packing, American Samoa

Enclosed is a draft study plan for the bioassay and modeling re-evaluation studies required under the ocean dumping permits for the two canneries. We have suggested an alternative species for the Group 1 bioassays for reasons presented on page 1-3 of the draft study plan. Because of the delayed submittal of the study plans it may be necessary to delay the first sampling if the study plan cannot be reviewed quickly or substantial changes are required. I do not see this as a problem and suggest delaying each of the three sampling episodes by the same amount to maintain the desired spacing. This will <u>not</u> delay the completion of the overall project. We can delay the sampling by up to two months or more and still finish the study well ahead of schedule.

Please call me if you have any questions. Comments should be addressed directly to me and copied to Norman Wei and Jim Cox. I have sent Sheila Wiegman at ASEPA the same information.

Sincerely,

CH2M HILL

Steven L. Costa Project Manager

cc:

Norman Wei/StarKist Seafood Company James Cox/Van Camp Seafood Company





Com to Almota

October 28, 1993

Office of Pacific Island and Native American Programs (E-4) USEPA, Region IX 75 Hawthorne St. San Francisco, Ca. 94105-3901

Dear Sir:

On Tuesday, October 26, 1993, Mr. Barry Fowler reported by telephone to Miss Sheila Weigman (ASEPA) that VCS Samoa Packing Company had exceeded the Ammonia limit for Press Water and Precooker Juice as defined in Ocean Dumping Permit O.D. 93-02 Special.

A/ Details are as follows: Sample Date: 9-01-93 Analysis Date: 9-14-93 Sample Source: Press Water Parameter: Ammonia 830 mg/l Analysis: 1430 mg N/l Permit Limit:

Analysis Date: 9-14-93 B/ 9-01-93 Sample Date: Sample Source: Pre-cooker Parameter: Ammonia Juice

Permit Limit: 410 mg/l Analysis: 960 mg N/1

The composite sample collected on 9-01-93, were analyzed in AECOs Honolulu laboratory by their technicians according to procedures specified in Special Condition 3.1.3 of the Permit.

The results of the analysis of the samples, were tabulated with other results and the report was received at Samoa Pacing on October 21. No cause has been established for this abnormal result at this time.

This report is submitted in accordance with Section 3.3.4 of Ocean Dumping Permit No. OD93-02 Special.

Sincerely,

VCS Samoa Packing Company

Michael P. Macready General Manager

copies: File E-7000



VCS SAMOA PACKING COMPANY



Office of Pacific Island and Native American Programs (E-4) USEPA, Region IX 75 Hawthorne St. San Francisco, Ca. 94105-3901

Dear Sir:

On Saturday, October 16, 1993, Mr. Barry Fowler reported by telephone to Miss Sheila Weigman (ASEPA) that VCS Samoa Packing Company had exceeded the 5 day B.O.D. limit for DAF Sludge as defined in Ocean Dumping Permit O.D. 93-02 Special.

Details are as follows:

Sample Date: 10-06-93 Parameter: BOD5

Permit Limit: 349,350 mg/l

Analysis Date: 10-12-93 Sample Source: DAF Sludge

Analysis: 400,000 mg/l

The composite sample collected on 10-06-93 was split into two (2) sub-samples which were analyzed in VCS Samoa Packings laboratory by company technicians according to procedures specified in Special Condition 3.1.3 of the Permit.

The results of the analysis of the two sub-samples, (480,000 mg/l and 320,000 mg/l) were averaged for a final figure of 400,000 mg/l. No cause has been established for this abnormal result at this time.

We feel it worth noting that a weighted average of BOD5 for DAF Sludge, Press Juice and Pre-cooker Water was significantly lower than a similar theoretical weighted average for these streams calculated against permit limits. (See attached Table A). The three sources are completely mixed together before being transported to the designated dumpsite where they are discharged as one homogenous stream.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 9

75 Hawthorne Street San Francisco, CA 94105-3901

DEC 0 3 1996

Norman Wei Corporate Environmental Manager StarKist Foods, Inc. 1054 Ways Street Terminal Island, CA 90731

Subject:

Administrative Extension of the Marine Protection, Research and Sanctuaries

Act (MPRSA) Section 102 Special Ocean Disposal Permit, OD-93-01

Dear Mr. Wei:

Pursuant to the Administrative Procedures Act (5 U.S.C. Section 558), we have decided to administratively extend StarKist Samoa's Ocean Disposal Permit OD-93-01 until April 30, 1997. We are continuing to evaluate the information submitted by StarKist Samoa and VCS Samoa Packing as required by their present permits and will reissue these permits by this date. A draft permit will be submitted for your review prior to this time.

Should you have any questions on the administrative extension or your permit requirements, please call Pat Young, American Samoa Program Manager at (415) 744-1594.

Sincerely,

Water Management Division

Togipa Tausaga, ASEPA, American Samoa CC:

U.S. Coast Guard Liaison Officer, American Samoa

Barry Mills, StarKist Samoa, American Samoa Michael Burns, Blue North Fisheries, Seattle, WA

Steve Costa, CH2M Hill



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street San Francisco, CA 94105

OCT 0 3 1995

Norman Wei Corporate Environmental Manager StarKist Foods, Inc. 1054 Ways Street Terminal Island, CA 90731

Subject: Modification of Waste Stream Monitoring Requirements of

Special Ocean Disposal Permit #OD 93-01 for StarKist

Samoa, Inc.

Dear Mr. Wei:

The U.S. Environmental Protection Agency (EPA) Region IX is modifying the above-referenced special ocean disposal permit, as per Section 3.1.2.4 of this permit, effective October 6, 1995. This modification eliminates existing sampling, monitoring and maximum concentration limitations for the three individual waste streams which are the DAF sludge, cooker juice and press liquor. The modification establishes the onshore fish processing storage tank as the new sampling and monitoring location for the combined individual waste streams and also establishes new maximum concentration limitations for the combined-wastes (see Table 3 of the attached amendment). The onshore fish processing storage tank is the holding tank for the three individual waste streams prior to ocean disposal. The new maximum concentration limits for the combined waste stream from the onshore fish processing storage tank have been established based on EPA's review and analysis of data per Special Conditions 3.1.2.2. through 3.1.2.4, OD 93-01.

These modifications to the permit are detailed in the attached pages which replace the corresponding pages in the permit and are hereby incorporated into and made a part of the permit, OD 93-01.

Please be reminded that the permit expires August 31, 1996 and that an application for renewal must be submitted at least 180 days prior to its expiration date. Should you have any questions regarding this revision or re-application, please call Pat Young, American Samoa Program Manager at (415) 744-1594 or Allan Ota, Ocean Disposal Coordinator at (415) 744-1980.

Sincerely,

Amv Zimpfer

Chief, Watershed Protection Branch

Water Management Division

Enclosure

cc: See attached mailing list

2.4. Fish Processing Waste Stream Limits

 Table 3.
 Limits for the Onshore Storage Tank

Physical or Chemical Parameter (units)*	Limits for Onshore Storage Tank
Total Solids (mg/L)	95,760
Total Volatile Solids (mg/L)	77,170
5-Day BOD (mg/L)	105,900
Oil & Grease (mg/L)	52,110
Total Phosphorus (mg/L)	3,080
Total Nitrogen (mg/L)	13,370
Ammonia (mg/L)(mg/L)	7,640
pH (pH units)	6.2 to 7.3
Density (g/mL)	0.93 to 1.05

^{*} All calculated values were rounded to the nearest 10 except density and pH ranges.

2.4.1. Permitted Maximum Concentrations were calculated based on an analysis of data gathered by the permittee through bi-monthly sampling of the onshore waste storage tank, from 9/93 to 8/94, as detailed under Section 3.1.2 of the permit. The calculations followed EPA's recommended procedure for determining permit limits as defined in the EPA document titled: Guidance Document for Ocean Dumping Permit Writers, January 30, 1988. (See attached fact sheet for details.)

EPA Region IX will periodically review these limits during the permit to evaluate the accuracy of the limits. If revisions are necessary, EPA Region IX will make changes according to the authority defined in the Ocean Dumping Regulations at 40 C.F.R. §§ 223.2 through 223.5.

2.4.2. The Permitted Maximum Concentrations, density range and pH range listed above, shall not be exceeded at any time during the term of this permit.

3. SPECIAL CONDITIONS - ANALYSIS OF FISH PROCESSING WASTES

Condition 2.4 shall be determined by monthly monitoring of the waste stored in the permittee's onshore fish processing waste storage tank. DAF sludge, cooker juice and press liquor are stored in the onshore storage tank prior to ocean disposal. Reporting requirements are defined in this section. Any fish processing waste sampling dates shall be scheduled within the first two weeks of the month to allow enough time for laboratory analyses and report writing to comply with Special Condition 3.3.

3.1. Analyses of Fish Processing Wastes

3.1.1. Concentrations or values of the parameters listed in Special Condition 2.4 shall be determined for the waste stream sample from the onshore storage tank during the transfer of these wastes to the disposal vessel's holding tanks. Three samples shall be taken from the onshore storage tank transfer line at 10-minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee. The detection limits specified in Table 4 below shall be used.

Table 4. Physical and Chemical Parameters to be Analyzed from Fish Processing Waste Stored in the Onshore Storage Tank

Parameter	Method Detection Limit
Total Solids	10.0 mg/L
Total Volatile Solids	10.0 mg/L
5-Day BOD	10.0 mg/L
Oil and Grease	10.0 mg/L
Total Phosphorus	1.0 mg/L
Total Nitrogen	1.0 mg/L
Ammonia	1.0 mg/L
pН	0.1 pH units
Density	0.01 g/mL

(Special Conditions 3.1.2, including 3.1.2.1through 3.1.2.4, are hereby deleted, effective October 6, 1995.)

- 3.1.3 All sampling procedures, analytical protocols, and quality control/quality assurance procedures shall be performed according to guidelines specified by EPA Region IX. The following references shall be used by the permittee:
 - 3.1.3.1. 40 C.F.R. Part 136, EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act;
 - 3.1.3.2. Tetra Tech, Incorporated. 1985. Summary of U.S. EPA-approved Methods, Standard Methods and other Guidance for 301(h) Monitoring Variables. Final program document prepared for the Marine Operations Division, Office of Marine and Estuarine Protection, U.S. Environmental Protection Agency. EPA Contract No. 68-01-693. Tetra Tech, Incorporated, Bellevue, WA; and,
 - 3.1.3.3. Environmental Protection Agency. 1987. Quality Assurance and Quality Control for 301(h) Monitoring Programs: Guidance on Field and Laboratory Methods. Office of Marine and Estuarine Protection, Washington, D.C., EPA 430/9-86-004.

3.2. Analytical Laboratory

3.2.1. Within 30 days of the effective date of this permit, the name and address of the contract laboratory or laboratories and a description of all analytical test procedures and quality assurance/quality control procedures, including detection limits being used, shall be provided for EPA Region IX approval.

FACT SHEET

Calculations for Onshore Fish Waste Storage Tank

Fish waste permits for Starkist Samoa and VCS Samoa Packing

CALCULATION OF REVISED PERMIT LIMITS

- 1. Data collected from the onshore storage tank from September 1993 through August 1994 were used to calculate the revised permit limits. The data for each cannery were evaluated separately.
- 2. Because variation in these waste streams is such that constituent values are not normally distributed, the data were converted with a logarithmic transformation. The following calculations were then made for each set of data, including mean, standard deviation, and the number of points.
- 3. Any data values determined to be significantly different from the population of data points by visual inspection of scatter plots, and/or confirmed to be greater than or less than the mean plus or minus 2 standard deviations, were considered to be outliers. Outlier data points were not used in the permit limit calculations.
- 4. All procedures for calculating permit limits are discussed in Sections 3.1.1 and 3.1.2 (pages 3-1- to 3-9) of EPA's Guidance Document for Ocean Dumping Permit Writers (January 30, 1988).
 - a. The mean and standard deviation of each physical or chemical parameter were calculated by the following equations:

$$Mean_{x} = \underbrace{\begin{array}{c} \Sigma x_{i} \\ N \end{array}}$$

 x_i = each value for the ith constituent N = the number of data points reported

Standard Deviation_x =
$$\frac{\sum \{x_i - Mean_x\}^2}{N - 1}$$

b. The permit limit (Upper Limit) was determined by taking the mean and adding the product of a constant multiplied by the standard deviation.

Upper $Limit_x = Mean_x + (k \times Standard Deviation_x)$

k = a constant from Table 3-2 in EPA's 1988 Guidance Document.

- c. The constant (k) is based on N and two variables, probability (gamma) and proportion (P), used to compute permit limits. In this case, all limits were calculated with gamma = 0.90 and P = 0.95.
- 5. The calculated permit limit for the transformed data was then reconverted back to an untransformed value by obtaining the anti-log of the calculated permit limit as follows:

Converted permit $\lim_{x \to a} E^x$

(x = transformed permit limit; E = 2.7183)

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION IX

75 Hawthorne Street San Francisco, CA 94105

September 7, 1995

Michael Crook
Chief Investigator
Cannery Ocean Monitoring Program
c/o StarKist Samoa, Inc.
Attn: Engineering Department
P.O. Box 368
Pago Pago, AS 96799

Re: Conducting Ocean Disposal Site Monitoring from the Cannery Disposal Vessel for Ocean Disposal Permits No. OD-93-01 and OD-93-02

Dear Mr. Crook:

We are in receipt of your letter of July 19, 1995 to the American Samoa Environmental Protection Agency, in which you discuss reasons why the monthly ocean disposal site monitoring for cannery wastes could be done from the disposal vessel. In the past, you have conducted the required monitoring from a separate vessel. We agree with your reasoning that the discharge vessel may be better suited for the monitoring, both from an equipment and safety standpoint, and that the permits do not prohibit monitoring from the disposal vessel. After reviewing your letter, discussing the matter with ASEPA, and finding no objections from Norman Wei of Star-Kist Foods, Inc. and Jim Cox of Van Camp Seafood Company, Inc., we see no reason why we should not grant your request.

Thus, we approve your request to conduct the monthly monitoring of the fish waste disposal site as required by the above-referenced permits, from the disposal vessel. The dumpsite monitoring protocol should continue to be observed, as outlined in the permits. Additionally, please insure that no wastewater is leaking from the boat while samples are being collected. Should you have any questions regarding this matter, please contact Pat Young, American Samoa Program Manager, at 415/744-1594.

Norman L. Lovelace

Chief, Office of Pacific Islands

Red 8/10/95

Sheila Weigmann ASEPA Utulei, American Samoa 19 July, 1995

Dear Sheila,

Following up on our conversation concerning the acceptability of conducting the monthly ocean dumpsite monitoring surveys from aboard the discharge vessel itself, here are some reasons as to why this could be allowed;

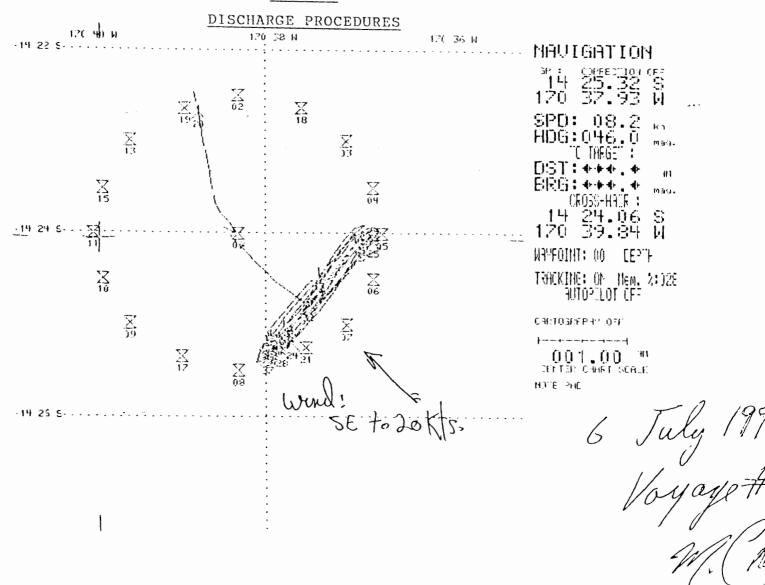
- 1) Part 5.1 of the permit indicates that the monitoring trips should be conducted during the first two weeks of each month. In the past this has often been a problem due to poor weather conditions, particularly in the winter months, inhibiting the smaller vessels typically used for the surveys. The much larger and safer discharge vessel would allow the surveys to be conducted during the first few days of every month on a regular basis.
- 2) There is nothing specific in the permit that prohibits monitoring from the discharge vessel. Because the discharge locations and patterns run by the discharge vessel are monitored on a trip by trip basis with video plotter printouts, the presence of a second party/vessel is not really essential to verify these procedures.
- 3) The electronic equipment available on the discharge vessel allows the monitoring procedures detailed in permit parts 7.13 7.1.45 to be carried out exactly, particularly in regards to starting monitoring station 1 in the middle of the plume at the point where discharge operations began. Of the attached examples, navigational plot printout #2 shows each sample stations' position relative to the original waste plume location when compared to Plot #1 (the required plot of discharge operations for every trip the discharge vessel makes) as well as the distances between monitoring stations and the drift direction of the plume.

After having conducted these ocean monitoring surveys for more than five years, I cannot objectively see any conflicts or problems generated by doing these monitoring surveys aboard the discharge vessel itself, particularly when it is remembered that it is the permitee(s) (Starkist and VCS) that are in charge of monitoring their own wastewater producing activities.

Best Regards,

Mike Crook, Chief Investigator Ocean Monitoring Program

PLOT #1



PLOT #2

SAMPLING STATIONS 1-5 170 38 N 1.70 40 N 170 36 N MAUIGATION 汉15 $\underset{04}{\mathbb{X}}$ WAYFOIRT: 00 TRACKINE: On them. 4: 196 AUTOPILOT CFF 汉 Ocean Dumpzone Monitoring Stations Current/Drift direction Northwest OHE 3"CH

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14:58

Memo

To:

Pat Young, American Samoa Program Manager - USEPA

From:

Jim Cox

Date:

August 22, 1995

Re:

OCEAN DUMPING MONITORING BY MIKE CROOK

Van Camp Seafood Company, Inc. has no objection of continuing with Mike Crook as our contract Ocean Monitoring Chief Investigator. I feel he is the most qualified at this point to do the monitoring and this will also address an important safety issue. Please issue your approval.

I appreciate your advising me of the letter since I was not aware of it.

Jim Cox

JLC:ms 082295.1JC

1/6/95
Spoke with Norman Wer of SK Foods of he has no problem w/ mile Creak's request.

Pat pring



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street San Francisco, CA 94105 September 14, 1993

Michael F. Burns Blue North Fisheries 1130 NW 45th Seattle, WA 98107

Re: Printed Record of FV TASMAN SEA's Disposal Trips

Dear Mr. Burns:

Yesterday we received your fax dated 8/31/93, which included a hard copy of a simulated navigational plot, produced by the printer which will be used in American Samoa, for printing out navigational records of the FV TASMAN SEA during its cannery waste disposal operations. We understand that the GPS system on board the vessel will produce a more accurate and defined version of the plots than the faxed copy we received.

We would appreciate receiving a schedule of when you anticipate the printer will be installed and working in American Samoa, as well as the name of the printer being used and its specifications (similar to what you submitted on June 3, 1993 for approval of the FV TASMAN SEA'S navigation system and plotter). When the entire system is working properly in Samoa, please send us a hard copy record of the navigational plot of an actual disposal operation. Copies of the above information should also be submitted to the American Samoa EPA and the Coast Guard Liaison Officer in American Samoa.

I will be in American Samoa the week of October 4th and hope to meet with representatives of both canneries, and possibly tour the disposal vessel. Should you have any questions regarding the above request, please contact me at (415) 744-1594.

Sincerely,

Pat Young

American Samoa Program Manager
Office of Pacific Island and
Native American Programs (E-4)

cc: Tony Tausaga, ASEPA
Sheila Wiegman, ASEPA
Lt. Cmdr. Richard Kaser, USCG-LO
Jim Cox, VCS Samoa Packing Co.
Norman Wei, StarKist Seafoods
Maurice Callaghan, StarKist Samoa
Michael Macready, Samoa Packing Co.
Bud Hayes, FV TASMAN SEA



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION IX

AUG 27 1993

75 Hawthorne Street
San Francisco, Ca. 94105-3901

Norman S. Wei, Senior Manager Environmental Engineering StarKist Foods, Inc. 1 River Front Place Newport, KY 41071

SUBJECT: Issuance of a Special Ocean Dumping Permit #OD 93-01 to StarKist Samoa

Dear Mr. Wei:

The U.S. Environmental Protection Agency (EPA) Region IX is issuing the enclosed special ocean dumping permit to StarKist Samoa, Inc. (#OD 93-01) under §102 of the Marine Protection, Research and Sanctuaries Act. The effective date of the permit is September 1, 1993. This permit authorizes disposal of StarKist Samoa's fish processing wastes off American Samoa for a three year period.

During the 30-day comment period on the draft permit, EPA Region IX only received comments from StarKist Seafoods. Responses to StarKist's letter and responses to VCS Samoa Packing's comments on their draft permit are enclosed with this notice. After carefully reviewing the comments submitted by StarKist Seafoods and coordinating responses with the American Samoa EPA, EPA Region IX has determined that the MPRSA §102 permit should be issued to StarKist Samoa. A copy of the permit showing EPA Region IX's changes is enclosed. The changes appear as shaded letters for additions and lined-out letters for deletions.

Information gathered during the term of the new special permit will be used to continue EPA Region IX's management of the fish processing waste disposal program off American Samoa. If at any time EPA Region IX determines that StarKist Samoa violates its permit or its disposal operations do not meet the ocean dumping regulations at 40 C.F.R. Parts 220 through 228, we will reconsider our authorization for use of the designated site.

If you have any questions regarding the ocean dumping permits, please contact Brian Ross at (415) 744-1979 or Patricia Young at (415) 744-1594.

Sincerely,

Clarence Tenley, Acang Chief

Wetlands, Oceans and Estuaries Branch

Enclosures (3)

RESPONSE TO COMMENTS ON OCEAN DUMPING PERMITS FOR AMERICAN SAMOA FISH CANNERIES

Responses to Comments from Van Camp Seafood Company for VCS Samoa Packing (June 22, 1993)

VCS Samoa Comment 1. VCS Samoa Packing requested that the bioassays and computer modeling required in Special Condition 3.3.5 be deleted because the waste streams are the same as the waste streams in 1987 and the those evaluated in a computer model in 1990.

EPA Region IX Response. In 1987, the only waste being disposed at the ocean disposal site was DAF Sludge. This was the only waste used in the bioassay tests because the other wastes, Precooker Water and Press Water, were being discharged through the outfall in Pago Pago Harbor. Bioassays were not required for Special Ocean Dumping Permit OD 90-02 because EPA Region IX relied on data from previous research ocean dumping permits for the waste characterizations. In addition, recent data on the characteristics of the three waste streams now authorized for disposal at the ocean disposal site shows significant changes in each waste compared to conditions before OD 90-02 was issued.

EPA Region IX considered the following points before requiring bioassays: 1) changes in the characteristics of each waste stream, 2) the way that wastes are combined, and 3) disposal of combined wastes from the ocean disposal vessel. EPA Region IX decided that the suspended particulate phase bioassays should be conducted using samples taken from the permittees' onshore storage tanks, not the individual waste streams generated at the permittees' plants.

We determined that replicate suspended particulate phase bioassays should be conducted at least three separate times during the first year of the new permits. Special Condition 3.3.5 has been rewritten to require samples of the onshore storage tanks to be taken on November 30, 1993, February 28, 1994 and May 31, 1994 to cover any potential seasonal changes in fish processing waste characteristics.

When new bioassays are conducted, the LC₅₀, the release zone, the mixing zone and the limiting permissible concentration (LPC) of the fish processing wastes discharged at the disposal site may change. This necessitates a reevaluation of the disposal site model to ensure that the LPC is not exceeded within the disposal site 4 hours after disposal or anytime outside the disposal site boundary. Reevaluation of the plume model should be conducted using the results of VCS Samoa Packing's suspended particulate phase bioassays alone, StarKist Samoa's suspended particulate phase bioassays alone, and a plume model combining waste from both canneries. Analysis of the three situations is necessary to evaluate a disposal vessel load consisting of VCS Samoa Packing wastes only, StarKist Samoa wastes only or a combination of wastes from both canneries. The model evaluation should be similar to the one presented to EPA Region IX in March 1990.

EPA Region IX has revised Special Condition 3.3 to require chemical analysis of samples from the canneries' onshore storage tanks twice each month for one year. These

results will provide a better characterization of the wastes actually disposed at the ocean disposal site. These data may be used in future permitting actions to reduce the number of chemical analyses performed on the canneries' waste streams.

VCS Samoa Packing Comment 2. The new limits may not represent the actual waste stream concentrations. The new limits may result in VCS Samoa Packing exceeding their permit limits. Of particular concern were the ammonia and oil and grease limits for Precooker Water.

EPA Region IX Response. According to EPA's Guidance Document for Ocean Dumping Permit Writers (January 30, 1988):

Although using the maximum reported concentration for the waste constituent [as a permit limit] may be acceptable, it is not recommended because the maximum reported concentration may be an outlier [defined as a waste concentrations that is plus or minus three standard deviations from the mean waste concentration], a value outside the normally expected values. Because it is impossible to determine whether the maximum reported value is an outlier without further analysis, it is better to base concentration limits on statistical estimates of variation in waste concentrations.

Limits set on statistical measures of variations in waste concentrations allow the Agency [EPA] to determine the significance of concentrations in monitoring reports that exceed the set limit. If the permit limit is set on the 95th percentile [as limits for VCS Samoa Packing and StarKist Samoa are set], for example, 5 measures out of 100 would exceed the permit solely by chance...(page 3-3).

For the reasons discussed above, EPA Region IX calculated the outliers for each waste concentration and removed them from the permit limit calculations for both canneries. Knowing the variable nature of fish processing wastes, EPA Region IX selected the 95th percentile because we do not expect all reported concentrations to fall within the limits listed in the permit. EPA Region IX has enforcement discretion when evaluating permit monitoring results from both canneries. Therefore, we have determined that the waste limits for VCS Samoa Packing should remain as they are listed in the permit.

VCS Samoa Packing Comment 3. The pH limit for Precooker Water and Press Water should be changed to 7.0 pH units to protect equipment.

EPA Region IX Response. EPA Region IX agrees with VCS Samoa Packing's request. The limit for the pH range for all three fish processing wastes has been changed to 7.0 in Table 3 of Special Condition 2.3. This change will also be incorporated into Table 3 of Special Condition 2.3 in the StarKist Samoa permit.

Responses to Comments from StarKist Seafoods Inc. for StarKist Samoa (June 30, 1993)

StarKist Samoa Comment 1. Each cannery should be held liable only for its own fish processing wastes during disposal operations when both canneries' wastes are being transported and disposed at the ocean site.

EPA Region IX Response. Each cannery is liable for its own fish processing waste stream limits as defined in its permit. When fish processing wastes from both canneries are pumped into the ocean disposal vessel for transportation to the ocean disposal site, both canneries and the waste transporter are liable for violations of the ocean dumping permits, though the wastes are maintained in separate holding tanks.

As the FV TASMAN SEA is designed now, wastes from both canneries are placed in separate holding tanks and discharged to the ocean through a common pipe and discharge port. If the wastes were discharged simultaneously through the same port or through separate ports, it would be difficult to assign separate liability for any detected violations in the receiving water. The present disposal procedure, was well as other possible disposal configurations for the disposal vessel, requires that both canneries be held individually liable for violations of the ocean dumping permits. Therefore, General Condition 1.2 will not be changed. However, if waste from only one cannery is placed onboard the disposal vessel and disposed at the ocean site, the cannery generating the waste will be solely responsible for any permit violations.

StarKist Samoa Comment 2. Revise the volumes of fish processing wastes generated at their plant as follows:

Fish Processing Wastes Generated	Application Volume (gallons/day)	Revised Volume (gallons/day)	Change (gallons/day)		
DAF Sludge	60,000	30,000	-30,000		
Cooker Juice	100,000	70,000	-30,000		
Press Liquor	40,000	100,000	+60,000		
Total Generated	200,000	200,000	0		

Revisions are needed to reflect the volumes of waste generated at StarKist Samoa's plant now. According to calculations by StarKist (July 28, 1993), changes in the volume of StarKist Samoa's waste will not have a significant effect on the loading of wastes at the disposal site.

EPA Region IX Response. The proposed increase in the volume of Press Liquor generated at StarKist Samoa's plant required an evaluation of the loading of fish processing wastes disposed at the ocean site. The three tables enclosed with these responses (Evaluation of Fish Cannery Loadings at the American Samoa Ocean Disposal Site, August 1993) document EPA

Region IX's analysis of StarKist Samoa's proposed changes in the volumes of fish processing wastes generated at their plant.

The concentrations of regulated parameters in the canneries' waste streams have changed substantially since the 1990 ocean dumping permits were issued (see the last two rows on page 2 of the table). If the ocean dumping permits were issued as requested in the canneries' December 8, 1992 applications, loadings at the ocean disposal site would decrease by 22-36% for 8 parameters, and the ammonia loading would decrease by 87%. Granting StarKist Samoa's requested volume changes would reduce the loading of 8 parameters by 12-29%, and ammonia loading would still decrease by 87% (see the last 2 rows on page 3 of the table). Considering the reductions in fish processing waste loading at the ocean disposal site, EPA Region IX will change the permitted volumes of waste generated at StarKist Samoa's plant to: 30,000 gallons/day for DAF Sludge, 70,000 gallons/day for Cooker Juice, and 100,000 gallons/day for Press Liquor (see Special Condition 2.3).

StarKist Samoa Comments 3 and 4. StarKist Samoa requested that they report the actual volume of combined wastes disposed daily at the ocean disposal site, in place of monitoring the volume of each waste stream generated daily. The three waste streams are combined in an onshore storage tank. The composite mixture should be analyzed monthly instead of the monthly analysis of each waste stream onshore. The composite mixture would provide a better representation of the characteristics of the wastes being disposed at the ocean site.

EPA Region IX Response. EPA Region IX agrees that analysis of the three waste streams combined in the onshore storage tank would provide a better characterization of wastes disposed at the ocean site. Continued reporting or the amount of each waste stream generated daily is important to document: a) the volumes of fish processing wastes generated at the plant, and b) the nature of the waste pumped into the onshore storage tanks for eventual ocean disposal. Report Form 1 in Appendix B has been revised to clarify reporting requirements for the daily volumes of fish processing waste generated at the permittee's plant and the daily volume of fish processing wastes disposed at the ocean site.

To obtain data more frequently, EPA Region IX changed the summary report period from 6 months to 3 months (see Special Condition 3.3.2). Consequently, Report Form 2 in Appendix B has been changed to reflect the 3-month reporting period and to allow reporting of the cumulative, monthly, waste volumes for each calendar year.

The new ocean dumping permits will also require the canneries to analyze samples of the fish processing wastes streams combined in the onshore storage tanks before the wastes are loaded into the disposal vessel (see Special Condition 3.3). Once sufficient data are obtained, EPA Region IX will consider deleting the requirements for monthly analysis of the three individual waste streams for each cannery. New limits for the composite wastes cannot be calculated now because data have not been obtained to support new limits.

StarKist Samoa Comment 5. StarKist Samoa requested that bioassays of fish processing wastes and a reevaluation of the disposal site model be deleted from the permit because characteristics of the waste streams have remained essentially the same. If bioassays are still

required, they requested that the site modeling report be deferred until 18 months after the effective date of the permit.

EPA Region IX Response. See EPA Region IX's response to VCS Samoa Packing's Comment 1. EPA Region IX agrees with StarKist's request for a longer time to prepare the model reevaluation report. Therefore, the submittal date for the report discussing new bioassays and the disposal plume reevaluation has been changed from 1 year to 18 months in both permits (see Special Condition 3.3.5).

StarKist Samoa Comment 6. StarKist Samoa requested that the requirement for computer modeling be deleted from Special Condition 3.3.5 because the dimensions of the FV TASMAN SEA fall within the range of vessels evaluated in the March 1990 modeling study.

EPA Region IX Response. See EPA Region IX's response to VCS Samoa Packing's Comment 1. The dimensions of the new disposal vessel are not the most important reasons for reevaluating the disposal plume model.

1990 Permit# & Waste ¹	Volume²	TS³	TS4	TVS	TVS	BOD	BOD	O&G	O&G	ТР	ТР	TN	TN	NH3	NH3
	gal/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	łb/day
OD 90-01 DAF Sludge	60000	230460	114990	182210	190916	376520	187868	129590	64660	3050	1522	18100	9031	7500	3742
OD 90-01 Precooker Water	100000	158290	131634	146900	122162	365450	303908	4830	4017	1150	956	21380	17780	21200	17630
OD 90-01 Press Water	40000	271920	90451	385630	128276	399090	132753	62150	20674	1990	662	31550	10495	21170	7042
StarKist Daily Loading	200000		337076		341354		624530		89350		3140		37306		28414
OD 90-02 DAF Sludge	60000	492000	245488	308700	154029	443840	221458	282750	141081	3910	1951	14950	7459	2570	1282
OD 90-02 Cooker Water	100000	257290	213962	358180	297862	60220	50079	207830	172831	2170	1805	20820	17314	2740	2279
OD 90-02 Press Water	40000	463780	154272	384560	127920	524270	174393	386480	128559	6860	2282	32020	10651	4940	1643
VCS Samoa Daily Loading	200000		613722		579811		445931		442471		6037		35424		5204
Total Daily Loading	400000		950798		921165		1070460		531822		9178		72730		33618
% StarKist Load Contribution	50		35		37		58		17		34		51		85
% VCS Samoa Load Contribution	50		65		63		42		83		66		49		15

Waste Stream Concentration (mg/L) x 3.875 (L/gallon) x 2.2046 (lbs/kg) x 1/1,000,000 (kg/mg) x Volume Generated (gallons/day) = Loading (lbs/day)

¹ Permits issued on July 31, 1990

² Volumes requested in the canneries' 1990 permit applications.

³ OD 90-01 and OD 90-02 permit limits calculated by EPA Region IX based on historical data.

⁴ Loading at the ocean disposal site calculated as follows:

August 1993

1993 Permit App.# & Waste ⁵	Volume ⁶	TS'	TS ⁴	TVS	TVS	BOD	BOD	O&G	O&G	ТР	ТР	TN	TN	NH3	NH3
	gal/day	mg/L	łb/day	mg/l,	lb/day	mg/l.	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
Original OD 93-01 DAF Sludge	60000	163430	81545	136180	67948	232320	115918	64100	31983	1640	818	7020	3503	1830	913
Original OD 93-01 Cooker Juice	100000	114180	94952	63400	52723	185150	153971	11810	9821	940	782	7560	6287	690	574
Original OD 93-01 Press Liquor	40000	327870	109063	292280	97224	310790	103381	112080	37282	3160	1051	20360	6773	1390	462
Original StarKist Daily Loading	200000		285560		217896		373270		79087		2651		16562		1949
Original OD 93-02 DAF Sludge	60000	461790	230415	455560	227306	349350	174312	395700	197438	3790	1891	21820	10887	3470	1731
Original OD 93-02 Precooker Water	100000	115180	95784	84450	70229	64650	53763	11180	9297	1850	1538	12830	10669	410	341
Original OD 93-02 Press Water	40000	381510	126905	409310	136153	365550	121597	165860	55172	2950	981	35100	11676	830	276
Original VCS Samoa Daily Loading	200000		453104		433688		349671		261907		4411		33232		2348
							-								
Original Total Daily Loading	400000		738664		651584		722941		340994		7062		49795		4298
% StarKist Load Contribution	50		39		33		52		23		38		33		45
% VCS Samoa Load Contribution	50		61		67		48		77		62		67		55
1993 Load - 1990 Load	0		-212135		-269581		-347519		-190827		-2116		-22936		-29321
% Change 1990 to Original 1993	0		-22		-29		-32		-36		-23		-32		-87

⁵ On December 8, 1992, StarKist Samoa and VCS Samoa Packing submitted their MPRSA §102 permit applications to EPA Region IX. On May 27, 1993, EPA Region IX determined that the applications were complete.

⁶ Volumes of fish processing wastes in the canneries' December 8, 1992 applications.

⁷ Permit limits calculated by EPA Region IX based on waste stream data collected under MPRSA \$102 permits OD 90-01 and OD 90-02.

August 1993

Changes to StarKist Permit App.	Volume ⁸	TS'	TS ⁴	TVS	TVS	BOD	BOD	O&G	O&G	TP	TP	TN	TN	NH3	NH3
	gal/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
Requested OD 93-01 DAF Sludge	30000	163430	40773	136180	33974	232320	57959	64100	15992	1640	409	7020	1751	1830	457
Requested OD 93-01 Cooker Juice	70000	114180	66466	63400	36906	185150	107780	11810	6875	940	547	7560	4401	690	402
Requested OD 93-01 Press Liquor	100000	327870	272657	292280	243060	310790	258453	112080	93206	3160	2628	20360	16931	1390	1156
Requested StarKist Daily Loading	200000		379896		313941		424192		116072		3584		23084		2014
Same OD 93-02 DAF Sludge	60000	461790	230415	455560	227306	349350	174312	395700	197438	3790	1891	21820	10887	3470	1731
Same OD 93-02 Precooker Water	100000	115180	95784	84450	70229	64650	53763	11180	9297	1850	1538	12830	10669	410	341
Same OD 93-02 Press Water	40000	381510	126905	409310	136153	365550	121597	165860	55172	2950	981	35100	11676	830	276
Same VCS Samoa Daily Loading	200000		453104		433688		349671		261907		4411		33232		2348
Proposed Total Daily Loading	400000		833000		747628		773863		377980		7995		56316		4363
% StarKist Load Contribution	50		46		42		55		31		45		41		46
% Change from Original SK App.	0		7		9		3		8		7		8		1
% VCS Samoa Load Contribution	50		54		58		45		69		55		59		54
SK 1993 Requested Load - SK 1990 Load	0		-117799		-173537		-296598		-153842		-1183		-16414		-29256
% Change SK 1990 to SK Requested 1993	0		-12		-19		-28		-29		-13		-23		-87

⁸ On June 30, 1993, StarKist Samoa requested changes in the volumes of fish processing wastes generated at their plant that could be disposed at the ocean site. StarKist Samoa made the following request: a) change DAF Sludge from 60,000 gallons per day to 30,000 gallons per day, b) change Cooker Juice from 100,000 gallons per day to 70,000 gallons per day, and c) change Press Liquor from 40,000 gallons per day to 100,000 gallons per day.

Togipa Tausaga, ASEPA cc: Sheila Wiegman, ASEPA

Commander, USCG-LO Pago Pago Maurice Callaghan, StarKist Samoa James Cox, Van Camp Seafood Company

Michael Macready, VCS Samoa Packing Company

Michael Burns, Blue North Fisheries



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street San Francisco, Ca. 94105-3901 AUG 2 7 1993

SUBJECT:

Issuance of Special Ocean Dumping Permits for StarKist Samoa, Inc.

(OD 93-01) and VCS Samoa Packing Company, Inc. (OD 93-02)

Dear Interested Party:

The U.S. Environmental Protection Agency (EPA) Region IX is issuing the enclosed special ocean dumping permits to StarKist Samoa, Inc. (OD 93-01) and VCS Samoa Packing Company, Inc. (OD 93-02) under §102 of the Marine Protection, Research and Sanctuaries Act (MPRSA). The effective date for the permits is September 1, 1993. These permits authorize disposal of fish processing wastes off American Samoa for a three year period.

During the 30-day comment period on drafts of the MPRSA §102 permits, EPA Region IX only received comments from StarKist Seafoods and Van Camp Seafoods. Responses to these comments are enclosed with this notice. After carefully reviewing the comments submitted by the canneries and coordinating responses with the American Samoa EPA, EPA Region IX determined that the MPRSA §102 ocean dumping permits should be issued to both canneries.

Information gathered during the term of the new permits will be used to continue EPA Region IX's management of the fish processing waste disposal program off American Samoa. If at any time EPA Region IX determines that violations of either permit occur or disposal operations do not meet the ocean dumping regulations at 40 C.F.R. Parts 220 through 228, we will reconsider our authorization for use of the designated site.

If you have any questions regarding the ocean dumping permits, please contact Brian Ross at (415) 744-1979 or Patricia Young at (415) 744-1594.

Sincerely,

Clarence Tenley, Kting Chief

Wetlands, Oceans and Estuaries Branch

Enclosures (3)

Norman S. Wei, Senior Manager Environmental Engineering StarKist Foods, Inc. 1 River Front Place Newport, KY 41071

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Michael Burns, President Blue North Fisheries 1130 NW 45th Seattle, WA 98107

David Dressel, Chief Shellfish Sanitation Branch (HFF-334) U.S. FDA, Room 3029 200 C Street, S.W. Washington, D.C. 20204

Francesca Cava, Chief Sanctuaries and Reserves Division NOAA 1305 East-West Highway Silver Spring, MD 20910

Michael Lee, Chief Environmental Branch Corps of Engineers, Honolulu District Building 230 Fort Shafter, HI 96858-5440

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Chief
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Thomas J. Gilmore, Counsel Van Camp Seafood Company, Inc. 4510 Executive Drive, Suite 300 San Diego, CA 92121-4566

FV TASMAN SEA StarKist Samoa, Inc. Attn: Bud Hayes Engineering Dept. P.O. Box 368 Pago Pago, American Samoa 96799

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Lelei Peau, Manager
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Malaetasi Togufau Attorney General Office of the Governor American Samoa Government Pago Pago, American Samoa 96799

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Dr. James Parrish Hawaii Cooperative Fisheries Research Unit 2528 The Mall University of Hawaii Honolulu, HI 96822

Dr. Dorothy Soule, Director Harbors Environmental Projects University of Southern California Allan Hancock Foundation 139 Los Angeles, CA 90089-0371

Dr. Joseph D. Germano
Director of Environmental Studies
SAIC
221 Third Street
Newport, RI 02840



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

AUG 27 1993

75 Hawthorne Street San Francisco, Ca. 94105-3901

MEMORANDUM

SUBJECT:

Issuance of Special Ocean Dumping Permits to StarKist Samoa (OD 93-01) and

VCS Samoa Packing Company (OD 93-02)

FROM:

Clarence Tenley, Acting Chief

Wetlands, Oceans and Estuaries Branch (W-7)

TO:

John Lishman, Chief

Marine Pollution Control Branch

Oceans and Coastal Protection Division (WH-556F)

Region IX has issued the attached special MPRSA §102 ocean dumping permits to StarKist Samoa (OD 93-01) and VCS Samoa Packing (OD 93-02) to dispose of fish processing wastes off American Samoa. The effective date of the permits is September 1, 1993.

During the 30-day comment period on the draft permits, EPA Region IX only received comments from VCS Samoa Packing and StarKist Seafoods. Responses to comments on the comment letters are attached. After carefully reviewing the comments submitted by the canneries and coordinating responses with the American Samoa EPA, EPA Region IX has determined that MPRSA §102 permits should be issued to VCS Samoa Packing and StarKist Samoa.

Information gathered during the term of the new special permits will be used to continue EPA Region IX's management of the fish processing waste disposal program off American Samoa. If at any time EPA Region IX determines that the permittees violate their permit or their disposal operations do not meet the ocean dumping regulations at 40 C.F.R. Parts 220 through 228, we will reconsider our authorization for use of the designated site.

If you have any questions regarding the ocean dumping permits, please contact Brian Ross at (415) 744-1979 or Patricia Young at (415) 744-1594.

Attachments (3)

cc:

David Redford, OCPD

Regional Ocean Dumping Coordinators, Regions I, II, III, IV, VI and X

RESPONSE TO COMMENTS ON OCEAN DUMPING PERMITS FOR AMERICAN SAMOA FISH CANNERIES

Responses to Comments from Van Camp Seafood Company for VCS Samoa Packing (June 22, 1993)

VCS Samoa Comment 1. VCS Samoa Packing requested that the bioassays and computer modeling required in Special Condition 3.3.5 be deleted because the waste streams are the same as the waste streams in 1987 and the those evaluated in a computer model in 1990.

EPA Region IX Response. In 1987, the only waste being disposed at the ocean disposal site was DAF Sludge. This was the only waste used in the bioassay tests because the other wastes, Precooker Water and Press Water, were being discharged through the outfall in Pago Pago Harbor. Bioassays were not required for Special Ocean Dumping Permit OD 90-02 because EPA Region IX relied on data from previous research ocean dumping permits for the waste characterizations. In addition, recent data on the characteristics of the three waste streams now authorized for disposal at the ocean disposal site shows significant changes in each waste compared to conditions before OD 90-02 was issued.

EPA Region IX considered the following points before requiring bioassays: 1) changes in the characteristics of each waste stream, 2) the way that wastes are combined, and 3) disposal of combined wastes from the ocean disposal vessel. EPA Region IX decided that the suspended particulate phase bioassays should be conducted using samples taken from the permittees' onshore storage tanks, not the individual waste streams generated at the permittees' plants.

We determined that replicate suspended particulate phase bioassays should be conducted at least three separate times during the first year of the new permits. Special Condition 3.3.5 has been rewritten to require samples of the onshore storage tanks to be taken on November 30, 1993, February 28, 1994 and May 31, 1994 to cover any potential seasonal changes in fish processing waste characteristics.

When new bioassays are conducted, the LC₅₀, the release zone, the mixing zone and the limiting permissible concentration (LPC) of the fish processing wastes discharged at the disposal site may change. This necessitates a reevaluation of the disposal site model to ensure that the LPC is not exceeded within the disposal site 4 hours after disposal or anytime outside the disposal site boundary. Reevaluation of the plume model should be conducted using the results of VCS Samoa Packing's suspended particulate phase bioassays alone, StarKist Samoa's suspended particulate phase bioassays alone, and a plume model combining waste from both canneries. Analysis of the three situations is necessary to evaluate a disposal vessel load consisting of VCS Samoa Packing wastes only, StarKist Samoa wastes only or a combination of wastes from both canneries. The model evaluation should be similar to the one presented to EPA Region IX in March 1990.

EPA Region IX has revised Special Condition 3.3 to require chemical analysis of samples from the canneries' onshore storage tanks twice each month for one year. These

results will provide a better characterization of the wastes actually disposed at the ocean disposal site. These data may be used in future permitting actions to reduce the number of chemical analyses performed on the canneries' waste streams.

VCS Samoa Packing Comment 2. The new limits may not represent the actual waste stream concentrations. The new limits may result in VCS Samoa Packing exceeding their permit limits. Of particular concern were the ammonia and oil and grease limits for Precooker Water.

EPA Region IX Response. According to EPA's Guidance Document for Ocean Dumping Permit Writers (January 30, 1988):

Although using the maximum reported concentration for the waste constituent [as a permit limit] may be acceptable, it is not recommended because the maximum reported concentration may be an outlier [defined as a waste concentrations that is plus or minus three standard deviations from the mean waste concentration], a value outside the normally expected values. Because it is impossible to determine whether the maximum reported value is an outlier without further analysis, it is better to base concentration limits on statistical estimates of variation in waste concentrations.

Limits set on statistical measures of variations in waste concentrations allow the Agency [EPA] to determine the significance of concentrations in monitoring reports that exceed the set limit. If the permit limit is set on the 95th percentile [as limits for VCS Samoa Packing and StarKist Samoa are set], for example, 5 measures out of 100 would exceed the permit solely by chance...(page 3-3).

For the reasons discussed above, EPA Region IX calculated the outliers for each waste concentration and removed them from the permit limit calculations for both canneries. Knowing the variable nature of fish processing wastes, EPA Region IX selected the 95th percentile because we do not expect all reported concentrations to fall within the limits listed in the permit. EPA Region IX has enforcement discretion when evaluating permit monitoring results from both canneries. Therefore, we have determined that the waste limits for VCS Samoa Packing should remain as they are listed in the permit.

VCS Samoa Packing Comment 3. The pH limit for Precooker Water and Press Water should be changed to 7.0 pH units to protect equipment.

EPA Region IX Response. EPA Region IX agrees with VCS Samoa Packing's request. The limit for the pH range for all three fish processing wastes has been changed to 7.0 in Table 3 of Special Condition 2.3. This change will also be incorporated into Table 3 of Special Condition 2.3 in the StarKist Samoa permit.

Responses to Comments from StarKist Seafoods Inc. for StarKist Samoa (June 30, 1993)

StarKist Samoa Comment 1. Each cannery should be held liable only for its own fish processing wastes during disposal operations when both canneries' wastes are being transported and disposed at the ocean site.

EPA Region IX Response. Each cannery is liable for its own fish processing waste stream limits as defined in its permit. When fish processing wastes from both canneries are pumped into the ocean disposal vessel for transportation to the ocean disposal site, both canneries and the waste transporter are liable for violations of the ocean dumping permits, though the wastes are maintained in separate holding tanks.

As the FV TASMAN SEA is designed now, wastes from both canneries are placed in separate holding tanks and discharged to the ocean through a common pipe and discharge port. If the wastes were discharged simultaneously through the same port or through separate ports, it would be difficult to assign separate liability for any detected violations in the receiving water. The present disposal procedure, was well as other possible disposal configurations for the disposal vessel, requires that both canneries be held individually liable for violations of the ocean dumping permits. Therefore, General Condition 1.2 will not be changed. However, if waste from only one cannery is placed onboard the disposal vessel and disposed at the ocean site, the cannery generating the waste will be solely responsible for any permit violations.

StarKist Samoa Comment 2. Revise the volumes of fish processing wastes generated at their plant as follows:

Fish Processing Wastes Generated	Application Volume (gallons/day)	Revised Volume (gallons/day)	Change (gallons/day)
DAF Sludge	60,000	30,000	-30,000
Cooker Juice	100,000	70,000	-30,000
Press Liquor	40,000	100,000	+60,000
Total Generated	200,000	200,000	0

Revisions are needed to reflect the volumes of waste generated at StarKist Samoa's plant now. According to calculations by StarKist (July 28, 1993), changes in the volume of StarKist Samoa's waste will not have a significant effect on the loading of wastes at the disposal site.

EPA Region IX Response. The proposed increase in the volume of Press Liquor generated at StarKist Samoa's plant required an evaluation of the loading of fish processing wastes disposed at the ocean site. The three tables enclosed with these responses (Evaluation of Fish Cannery Loadings at the American Samoa Ocean Disposal Site, August 1993) document EPA

Region IX's analysis of StarKist Samoa's proposed changes in the volumes of fish processing wastes generated at their plant.

The concentrations of regulated parameters in the canneries' waste streams have changed substantially since the 1990 ocean dumping permits were issued (see the last two rows on page 2 of the table). If the ocean dumping permits were issued as requested in the canneries' December 8, 1992 applications, loadings at the ocean disposal site would decrease by 22-36% for 8 parameters, and the ammonia loading would decrease by 87%. Granting StarKist Samoa's requested volume changes would reduce the loading of 8 parameters by 12-29%, and ammonia loading would still decrease by 87% (see the last 2 rows on page 3 of the table). Considering the reductions in fish processing waste loading at the ocean disposal site, EPA Region IX will change the permitted volumes of waste generated at StarKist Samoa's plant to: 30,000 gallons/day for DAF Sludge, 70,000 gallons/day for Cooker Juice, and 100,000 gallons/day for Press Liquor (see Special Condition 2.3).

StarKist Samoa Comments 3 and 4. StarKist Samoa requested that they report the actual volume of combined wastes disposed daily at the ocean disposal site, in place of monitoring the volume of each waste stream generated daily. The three waste streams are combined in an onshore storage tank. The composite mixture should be analyzed monthly instead of the monthly analysis of each waste stream onshore. The composite mixture would provide a better representation of the characteristics of the wastes being disposed at the ocean site.

EPA Region IX Response. EPA Region IX agrees that analysis of the three waste streams combined in the onshore storage tank would provide a better characterization of wastes disposed at the ocean site. Continued reporting or the amount of each waste stream generated daily is important to document: a) the volumes of fish processing wastes generated at the plant, and b) the nature of the waste pumped into the onshore storage tanks for eventual ocean disposal. Report Form 1 in Appendix B has been revised to clarify reporting requirements for the daily volumes of fish processing waste generated at the permittee's plant and the daily volume of fish processing wastes disposed at the ocean site.

To obtain data more frequently, EPA Region IX changed the summary report period from 6 months to 3 months (see Special Condition 3.3.2). Consequently, Report Form 2 in Appendix B has been changed to reflect the 3-month reporting period and to allow reporting of the cumulative, monthly, waste volumes for each calendar year.

The new ocean dumping permits will also require the canneries to analyze samples of the fish processing wastes streams combined in the onshore storage tanks before the wastes are loaded into the disposal vessel (see Special Condition 3.3). Once sufficient data are obtained, EPA Region IX will consider deleting the requirements for monthly analysis of the three individual waste streams for each cannery. New limits for the composite wastes cannot be calculated now because data have not been obtained to support new limits.

StarKist Samoa Comment 5. StarKist Samoa requested that bioassays of fish processing wastes and a reevaluation of the disposal site model be deleted from the permit because characteristics of the waste streams have remained essentially the same. If bioassays are still

required, they requested that the site modeling report be deferred until 18 months after the effective date of the permit.

EPA Region IX Response. See EPA Region IX's response to VCS Samoa Packing's Comment 1. EPA Region IX agrees with StarKist's request for a longer time to prepare the model reevaluation report. Therefore, the submittal date for the report discussing new bioassays and the disposal plume reevaluation has been changed from 1 year to 18 months in both permits (see Special Condition 3.3.5).

StarKist Samoa Comment 6. StarKist Samoa requested that the requirement for computer modeling be deleted from Special Condition 3.3.5 because the dimensions of the FV TASMAN SEA fall within the range of vessels evaluated in the March 1990 modeling study.

EPA Region IX Response. See EPA Region IX's response to VCS Samoa Packing's Comment 1. The dimensions of the new disposal vessel are not the most important reasons for reevaluating the disposal plume model.

August 1993

1990 Permit# & Waste¹	Volume ²	TS3	TS ⁴	TVS	TVS	BOD	BOD	O&G	O&G	TP	TP	TN	TN	NH3	NH3
	gal/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
OD 90-01 DAF Sludge	60000	230460	114990	182210	190916	376520	187868	129590	64660	3050	1522	18100	9031	7500	3742
OD 90-01 Precooker Water	100000	158290	131634	146900	122162	365450	303908	4830	4017	1150	956	21380	17780	21200	17630
OD 90-01 Press Water	40000	271920	90451	385630	128276	399090	132753	62150	20674	1990	662	31550	10495	21170	7042
StarKist Daily Loading	200000		337076		341354		624530		89350		3140		37306		28414
. • •							• .								
OD 90-02 DAF Sludge	60000	492000	245488	308700	154029	443840	221458	282750	141081	3910	1951	14950	7459	2570	1282
OD 90-02 C∞ker Water	100000	257290	213962	358180	297862	60220	50079	207830	172831	2170	1805	20820	17314	2740	2279
OD 90-02 Press Water	40000	463780	154272	384560	127920	524270	174393	386480	128559	6860	2282	32020	10651	4940	1643
VCS Samoa Daily Loading	200000		613722		579811		445931		442471		6037		35424		5204
Total Daily Loading	400000		950798		921165		1070460		531822		9178		72730		33618
% StarKist Load Contribution	50		35		37		58		17		34		51		85
% VCS Samoa Load Contribution	50		65		63		42		83		66		49		15

Waste Stream Concentration (mg/L) x 3.875 (L/gallon) x 2.2046 (lbs/kg) x 1/1,000,000 (kg/mg) x Volume Generated (gallons/day) = Loading (lbs/day)

¹ Permits issued on July 31, 1990

² Volumes requested in the canneries' 1990 permit applications.

³ OD 90-01 and OD 90-02 permit limits calculated by EPA Region IX based on historical data.

⁴ Loading at the ocean disposal site calculated as follows:

August 1993

1993 Permit App.# & Waste ⁵	Volume ⁴	TS7	TS4	TVS	TVS	BOD	BOD	0&G	O&G	TP	TP	TN	TN	NH3	NH3
	gal/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
Original OD 93-01 DAF Sludge	60000	163430	81545	136180	67948	232320	115918	64100	31983	1640	818	7020	35 03	1830	913
Original OD 93-01 Cooker Juice	100000	114180	94952	63400	52723	185150	153971	11810	9821	940	782	7560	6287	690	574
Original OD 93-01 Press Liquor	40000	327870	109063	292280	97224	310790	103381	112080	37282	3160	1051	20360	6773	1390	462
Original StarKist Daily Loading	200000		285560		217896		373270		79087		2651		16562		1949
Original OD 93-02 DAF Sludge	60000	461790	230415	455560	227306	349350	174312	395700	197438	3790 ·	1891	21820	10887	3470	1731
Original OD 93-02 Precooker Water	100000	115180	95784	84450	70229	64650	53763	11180	9297	1850	1538	12830	10669	410	341
Original OD 93-02 Press Water	40000	3 81510	126905	409310	136153	365550	121597	165860	55172	2950	981	35100	11676	830	276
Original VCS Samoa Daily Loading	200000		453104		433688		349671		261907		4411		33232		2348
Original Total Daily Loading	400000		738664		651584		722941		340994		7062		49795		4298
% StarKist Load Contribution	50		39		33		52		23		38		33		45
% VCS Samoa Load Contribution	50		61		67		48		77		62		67		55
1993 Load - 1990 Load	0		-212135		-269581		-347519		-190827		-2116		-22936		-29321
% Change 1990 to Original 1993	0		-22		-29		-32		-36		-23		-32		-87

⁵ On December 8, 1992, StarKist Samoa and VCS Samoa Packing submitted their MPRSA §102 permit applications to EPA Region IX. On May 27, 1993, EPA Region IX determined that the applications were complete.

⁶ Volumes of fish processing wastes in the canneries' December 8, 1992 applications.

⁷ Permit limits calculated by EPA Region IX based on waste stream data collected under MPRSA §102 permits OD 90-01 and OD 90-02.

August 1993

Changes to StarKist Permit App.	Volume ⁸	TS ⁷	TS4	TVS	TVS	BOD	BOD	0&G	0&G	ТР	TP	TN	TN	NH3	NH3
	gal/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
Requested OD 93-01 DAF Sludge	30000	163430	40773	136180	33974	232320	57959	64100	15992	1640	409	7020	1751	1830	457
Requested OD 93-01 C∞ker Juice	70000	114180	66466	63400	36906	185150	107780	11810	6875	940	547	7560	4401	690	402
Requested OD 93-01 Press Liquor	100000	327870	272657	292280	243060	310790	258453	112080	93206	3160	2628	20360	16931	1390	1156
Requested StarKist Daily Loading	200000		379896		313941		424192		116072		3584		23084		2014
Same OD 93-02 DAF Sludge	60000	461790	230415	455560	227306	349350	174312	395700	197438	3790	1891	21820	10887	3470	1731
Same OD 93-02 Precooker Water	100000	115180	95784	84450	70229	64650	53763	11180	9297	1850	1538	12830	10669	410	341
Same OD 93-02 Press Water	40000	381510	.126905	409310	136153	365550	121597	165860	55172	2950	981	35100	11676	830	276
Same VCS Samoa Daily Loading	200000		453104		433688		349671		261907		4411		33232		2348
Proposed Total Daily Loading	400000		833000		747628		773863		377980		7995		56316		4363
% StarKist Load Contribution	50		46		42		55		31		45		41		46
% Change from Original SK App.	0		7		9		3		8		7		8		1
% VCS Samoa Load Contribution	50		54		58		45		69		55		5 9		54
SK 1993 Requested Load - SK 1990 Load	0		-117799		-173537		-296598		-153842		-1183		-16414		-29256
% Change SK 1990 to SK Requested 1993	0		-12		-19		-28		-29		-13		-23		-87

^a On June 30, 1993, StarKist Samoa requested changes in the volumes of fish processing wastes generated at their plant that could be disposed at the ocean site. StarKist Samoa made the following request: a) change DAF Sludge from 60,000 gallons per day to 30,000 gallons per day, b) change Cooker Juice from 100,000 gallons per day to 70,000 gallons per day, and c) change Press Liquor from 40,000 gallons per day to 100,000 gallons per day.

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Fish Processing Waste Stream Limits

Table 3. Limits for DAF Sludge, Precooker Water and Press Water.

Physical or Chemical Parameter (units)	6 0,00 ♥ DAF Sludge	/ o o, o o o Precooker Water	40,000 Press Water	New Proposed On Shire Storage Tanh Limits
Total Solids (mg/L)	461,790	115,180	381,510	90,723
Total Volatile Solids (mg/L)	455,560	84,450	409,310	104,911
5-Day BOD (mg/L)	349,350	64,650	365,550	408,5367
Oil and Grease (mg/L)	395,700	11,180	165,860	76,677
Total Phosphorus (mg/L)	3,790	1,850	2,950	3,22/
Total Nitrogen (mg/L)	21,820	12,830	35,100	13,473
Ammonia (mg/L)	3,470	410	830	7,227 ¥
pH (pH units)	4.8 to 7.0	5.5 to 7.0	5.5 to 7.0	5.8 to 7.5
Density (g/mL)	0.86 to 1.05	0.95 to 1.06	0.96 to 1.06	.95 h 1.03

- a = All calculated values were rounded to the nearest 10, except density and pH ranges.
- 2.4.2. Permitted Maximum Concentrations for each type of fish processing waste stream were calculated based on an analysis of historical data from the permittee's previous Special Ocean Dumping Permit, number OD 90-01. The calculations followed EPA's recommended procedure for determining permit limits as defined in the EPA document titled: "Guidance Document for Ocean Dumping Permit Writers" (January 30, 1988). EPA Region IX will periodically review these limits during the permit to evaluate the accuracy of the limits. If revisions are necessary, EPA Region IX will make changes according to the authority defined in the Ocean Dumping Regulations at 40 C.F.R §§ 223.2 through 223.5.
- 2.4.3. The Permitted Maximum Concentrations, density range and pH range listed above, shall not be exceeded at any time during the term of this permit.

3. SPECIAL CONDITIONS - ANALYSIS OF FISH PROCESSING WASTES

Compliance with the permitted maximum concentrations defined in Special Condition 2.4 shall be determined by monthly monitoring of each of the fish processing waste streams. Additional analyses of fish processing wastes and reporting requirements are defined in this section. Any fish processing waste stream sampling dates shall be scheduled

45 6.5-8.4

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CALCULATIONS FOR NE	W PERMIT LIMIT:	\$				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Nurnber	Density	Derisity	Minus Untransformed	Minus Transformed	Column D	Column E
	(g/mL)	(g/mL)	Density Value	Density Value	Squared.	Squared
1	0.98	-0.020202707	0.022692308	0.022786077	0.000514941	0.000519205
2	1.02	0.019802627	-0.017307692	-0.017219258	0.000299556	0.000296503
3	1.01	0.009950331	-0.007307692	-0.007366962	5.34024E-05	5.42721E-05
4	1.03	0.029558802	-0.027307692	-0.026975433	0.00074571	0.000727674
5	1.03	0.029558802	-0.027307692	-0.026975433	0.00074571	0.000727674
6	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-06
7	1.02	0.019802627	-0.017307692	-0.017219258	0.000299556	0.000296503
8	1.02	0.019802627	-0.017307692	-0.017219258	0.000299556	0.000296503
9	1.01	0.009950331	-0.007307692	-0.007366962	5.34024E-05	5.42721E-05
10	1.02	0.019802627	-0.017307692	-0.017219258	0.000299556	0.000296503
11	0.98	-0.020202707	0.022692308	0.022786077	0.000514941	0.000519205
12	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-06
13	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-06
14	0.99	-0.010050336	0.012692308	0.012633705	0.000161095	0.000159611
15	0.98	-0.020202707	0.022692308	0.022786077	0.000514941	0.000519205
16	1.01	0.009950331	-0.007307692	-0.007366962	5.34024E-05	5.42721E-05
17	1.01	0.009950331	-0.007307692	-0.007366962	5.34024E-05	5.42721E-05
18	0.98	-0.020202707	0.022692308	0.022786077	0.000514941	0.000519205
19	0.99	-0.010050336	0.012692308	0.012633705	0.000161095	0.000159611
20	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-0€
21	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-06
22	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-0€
23	0.99	-0.010050336	0.012692308	0.012633705	0.000161095	0.000159611
24	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-06
25	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-06
26	1	0	0.002692308	0.002583369	7.24852E-06	6.6738E-06
Column Sum	26.07	0.0671676			0.005511538	0.005474165
Column Sum/N	1.002692308	0.002583369				
Column Sum/(N-1)					0.000220462	0.000218967
SQRT(Column Sum/(N-	1))				0.014847947	0.01479752
					Transformed conve	erted
		ļ	Untransformed	Transformed	to Untransformed	
		Mean	1.002692308		1.002586709	
		Std Dev	0.014847947		1.014907545	
	L fr	pper Permit Limit	1.034199652	* · · · · · · · · · · · · · · · · · · ·	1.034567749	
		wer Permit Limit	0.971184964	-0.028816967	0.971594282	
		Table 3-2 Const	 ant = 2.122			

CALCULATIONS FOR N	EW PERMIT LIMIT	\$				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	pН	рН	Minus Untransformed	Minus Transformed	Column D	Column E
	(pH Units)	(pH Units)	pH Value	pH Value	Squared	Squared
1	6.65	1.894616855	-0.045769231	-0.008749484	0.002094822	7.65535E -0 5
2	7.06	1.954445052	-0.455769231	-0.068577681	0.207725592	0.004702898
3	6.61	1.888583654	-0.005769231	-0.002716283	3.3284E-05	7.3782E - 06
4	7.39	2.000127735	-0.785769231	-0.114260364	0.617433284	0.013055431
5	6.73	1.906575144	-0.125769231	-0.020707773	0.015817899	0.000428812
6	6.87	1.927164106	-0.265769231	-0.041296736	0.070633284	0.00170542
7	6.43	1.860974538	0.174230769	0.024892832	0.030356361	0.000619653
8	6.28	1.83736998	0.324230769	0.04849739	0.105125592	0.002351997
9	6.86	1.925707442	-0.255769231	-0.039840071	0.065417899	0.001587231
10	6.74	1.908059925	-0.135769231	-0.022192554	0.018433284	0.000492509
11	6.93	1.935859813	-0.325769231	-0.049992443	0.106125592	0.002499244
12	6.96	1.940179474	-0.355769231	-0.054312104	0.126571746	0.002949805
13	6.94	1.937301775	-0.335769231	-0.051434404	0.112740976	0.002645498
14	6.68	1.899117988	-0.075769231	-0.013250617	0.005740976	0.000175579
15	7	1.945910149	-0.395769231	-0.060042779	0.156633284	0.003605135
16	6.72	1.905088155	-0.115769231	-0.019220784	0.013402515	0.000369439
17	7.36	1.996059933	-0.755769231	-0.110192562	0.57118713	0.012142401
18	6.32	1.843719208	0.284230769	0.042148162	0.08078713	0.001776468
19	6.02	1.795087259	0.584230769	0.090780111	0.341325592	0.008241029
20	6.16	1.818076778	0.444230769	0.067790593	0.197340976	0.004595564
21	6.25	1.832581464	0.354230769	0.053285907	0.125479438	0.002839388
22	6.2	1.824549292	0.404230769	0.061318078	0.163402515	0.003759907
23	6	1.791759469	0.604230769	0.094107901	0.365094822	0.00885ଛ297
24	6.02	1.795087259	0.584230769	0.090780111	0.341325592	0.008241029
25	6.5	1.871802177	0.104230769	0.014065194	0.010864053	0.00019783
26	6.03	1.796747011	0.574230769	0.08912036	0.329740976	0.007942439
Column Sum ,	171.71	49.03255163			4.180834615	0.095864933
Column Sum/N	6.604230769	1.885867371				
Column Sum/(N-1)					0.167233385	0.003834597
SQRT(Column Sum/(N-	1))				0.408941786	0.061924126
				· · · · · · · · · · · · · · · · · · ·	Transformed conve	rted
			Untransformed	Transformed	to Untransformed	
		Mean	6.604230769	1.885867371	6.59206973	
		Std Dev	0.408941786	•	1.06388162	
	Uı	pper Permit Limit	+	i company	7.517776116	
	'	ower Permit Limit	+	1.754464376	5.780350818	
		Table 3-2 Const	 ant = 2 122		Con a proportional and a second a second and a second and a second and a second and a second and	

Check water quality standards in permit.

CALCULATIONS FOR N	EW PERMIT LIMIT:	\$				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Ammonia	Ammonia	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	Ammonia Value	Ammonia Value	Squared	Squared
1	8400	9.035986985	-5829.615385	-1.338942899	33984415.53	1.792768088
2	560	6.327936784	2010.384615	1.369107302	4041646.302	1.874454804
3	840	6.733401892	1730.384615	0.963642194	2994230.917	0.928606277
4	3450	8.14612951	-879.6153846	-0.449085425	773723.2249	0.201677719
5	3480	8.154787573	-909.6153846	-0.457743487	827400.1479	0.2095291
6	6580	8.791790024	-4009.615385	-1.094745939	16077015.53	1.198468671
7	1880	7.539027056	690.3846154	0.15801703	476630.9172	0.024969382
8	1180	7.073269717	1390.384615	0.623774368	1933169.379	0.389094462
9	2650	7.882314919	-79.61538462	-0.185270833	6338.609467	0.034325282
10	1850		720.3846154	0.174103167	518953.9941	0.030311913
11	2390	7.779048645	180.3846154	-0.082004559	32538.60947	0.006724748
12	2000	7.60090246	570.3846154	0.096141626	325338.6095	0.009243212
13	2290	7.736307097	280.3846154	-0.039263011	78615.53254	0.001541584
14	2500	7.824046011	70.38461538	-0.127001925	4953.994083	0.016129489
15	2050	7.625595072	520.3846154	0.071449013	270800.1479	0.005104962
16	2300	7.740664402	270.3846154	-0.043620316	73107.84024	0.001902732
17	1960	7.580699752	610.3846154	0.116344333	372569.3787	0.013536004
18	1590	7.371489295	980.3846154	0.32555479	961153.9941	0.105985921
19	2030	7.615791072	540.3846154	0.081253013	292015.5325	0.006602052
20	2250	7.718685495	320.3846154	-0.02164141	102646.3018	0.000468351
21	1220	7.106606138	1350.384615	0.590437948	1823538.609	0.34861697
22	1440	7.272398393	1130.384615	0.424645693	1277769.379	0.180323965
23	2800	7.937374696	-229.6153846	-0.240330611	52723.22485	0.057758802
24	2240	7.714231145	330.3846154	-0.017187059	109153.9941	0.000295395
25	3370	8.122668023	-799.6153846	-0.425623938	639384.7633	0.181155736
26	3530	8.16905315	-959.6153846	-0.472009064	920861.6864	0.222792557
Column Sum	66830	200.1231462			68970696.15	7.842388177
Column Sum/N	2570.384615	7.697044086				
Column Sum/(N-1)					2758827.846	0.313695527
SQRT(Column Sum/(N-	1))				1660.971958	0.560085286
		f f			Transformed conve	erted
			Untransformed	Transformed	to Untransformed	
		Mean	2570.384615	7.697044086	2201.829942	i
		Std Dev	1660.971958	0.560085286	1.750821814	
		Permit Limit	6094.967111	8.885545061	7226.752625	1
		Table 3-2 Const	j ant = 2.122			

CALCULATIONS FOR N	EW PERMIT LIMITS	\$				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Total Nitrogen	Total Nitrogen	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	Total Nitrogen Value	Total Nitrogen Value	Squared	Squared
1	19040	9.854297308	-13208.46154	-1.287851094	174463456.2	1.658560439
2	2940	7.98616486	2891.538462	0.580281354	8360994.675	0.33672645
3	3080	8.032684876	2751.538462	0.533761339	7570963.905	0.284901167
4	5880	8.679312041	-48.46153846	-0.112865826	2348.52071	0.012738695
5	6160	8.725832057	-328.4615385	-0.159385842	107886.9822	0.025403847
6	7840	8.966994113	-2008.461538	-0.400547899	4033917.751	0.160438619
7	4480	8.407378325	1351.538462	0.159067889	1826656.213	0.025302593
8	8120	9.002085433	-2288.461538	-0.435639218	5237056.213	0.189781529
9	5880	8.679312041	-48.46153846	-0.112865826	2348.52071	0.012738695
10	5880	8.679312041	-48.46153846	-0.112865826	2348.52071	0.012738695
11	5880	8.679312041	-48.46153846	-0.112865826	2348.52071	0.012738695
12	4760	8.468002947	1071.538462	0.098443267	1148194.675	0.009691077
13	7280	8.892886141	-1448.461538	-0.326439926	2098040.828	0.106563026
14	6160	8.725832057	-328.4615385	-0.159385842	107886.9822	0.025403847
15	5880	8.679312041	-48.46153846	-0.112865826	2348.52071	0.012738695
16	7280	8.892886141	-1448.461538	-0.326439926	2098040.828	0.106563026
17	1960	7.580699752	3871.538462	0.985746462	14988810.06	0.971696088
18	4760	8.468002947	1071.538462	0.098443267	1148194.675	0.009691077
19	4480	8.407378325	1351.538462	0.159067889	1826656.213	0.025302593
20	7560	8.930626469	-1728.461538	-0.364180254	2987579.29	0.132627258
21	2800	7.937374696	3031.538462	0.629071519	9190225.444	0.395730975
22	4480	8.407378325	1351.538462	0.159067889	1826656.213	0.025302593
23	3080	8.032684876	2751.538462	0.533761339	7570963.905	0.284901167
24	7560	8.930626469	-1728.461538	-0.364180254	2987579.29	0.132627258
25	3920	8.273846933	1911.538462	0.292599282	3653979.29	0.08561434
26	4480	8.407378325	1351.538462	0.159067889	1826656.213	0.025302593
Column Sum	151620	222.7276016			255072138.5	5.081825035
Column Sum/N	5831.538462	8.566446215				
Column Sum/(N-1)					10202885.54	0.203273001
SQRT(Column Sum/(N-	1))				3194.195601	0.450858072
					Transformed conve	rted
			Untransformed	Transformed	to Untransformed	
		Mean	5831.538462	8.566446215	5252.430573	
		Std Dev	3194.195601	0.450858072	1.569658488	
		Permit Limit	12609.62153	9.523167044	13672.84522	
		Table 3-2 Const	ant = 2.122			

CALCULATIONS FOR N	EW PERMIT LIMIT:	5				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean	*	
Sample Number	Total Phos	Total Phos	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	Total Phos Value	Total Phos Value	Squared	Squared
1	3500	8.160518247	-2132.692308	-1.044672739	4548376.479	1.091341131
2	750	6.620073207	617.3076923	0.495772302	381068.787	0.245790176
3	1400	7.244227516	-32.69230769	-0.128382007	1068.786982	0.01648194
4	2400	7.783224016	-1032.692308	-0.667378507	1066453.402	0.445394072
5	2100	7.649692624	-732.6923077	-0.533847115	536838.0178	0.284992742
6	2200	7.696212639	-832.6923077	-0.58036713	693376.4793	0.336826006
7	600	6.396929655	767.3076923	0.718915854	588761.0947	0.516840005
8	1200	7.090076836	167.3076923	0.025768673	27991.86391	0.000664025
9	1000	6.907755279	367.3076923	0.20809023	134914.9408	0.043301544
10	1200	7.090076836	167.3076923	0.025768673	27991.86391	0.000664025
11	1000	6.907755279	367.3076923	0.20809023	134914.9408	0.043301544
12	1000	6.907755279	367.3076923	0.20809023	134914.9408	0.043301544
13	600	6.396929655	767.3076923	0.718915854	588761.0947	0.516840005
14	800	6.684611728	567.3076923	0.431233781	321838.0178	0.185962574
15	1900	7.549609165	-532.6923077	-0.433763656	283761.0947	0.18815091
16	2000	7.60090246	-632.6923077	-0.485056951	400299.5562	0.235280245
17	1200	7.090076836	167.3076923	0.025768673	27991.86391	0.000664025
18	1200	7.090076836	167.3076923	0.025768673	27991.86391	0.000664025
19	1000	6.907755279	367.3076923	0.20809023	134914.9408	0.043301544
20	1000	6.907755279	367.3076923	0.20809023	134914.9408	0.043301544
21	1000	6.907755279	367.3076923	0.20809023	134914.9408	0.043301544
22	700	6.551080335	667.3076923	0.564765174	445299.5562	0.318959702
23	1200	7.090076836	167.3076923	0.025768673	27991.86391	0.000664025
24	1000	6.907755279	367.3076923	0.20809023	134914.9408	0.043301544
25	2400	7.783224016	-1032.692308	-0.667378507	1066453.402	0.445394072
26	1200	7.090076836	167.3076923	0.025768673	27991.86391	0.000664025
Column Sum	35550	185.0119832			12034711.54	5.135348532
Column Sum/N	1367.307692	7.115845509		_		
Column Sum/(N-1)					481388.4615	0.205413941
SQRT(Column Sum/(N-	1))				693.8216352	0.453226148
					Transformed conve	rted
			Untransformed	Transformed	to Untransformed	
		Mean	1367.307692	7.115845509	1231.324267	
		Std Dev	693.8216352	0.453226148	1.573379963	
		Permit Limit	2839.597202	8.077591395	3221.464649	
		Table 3-2 Const	ant = 2.122			

CALCULATIONS FOR N	EW PERMIT LIMIT:	\$			1		
Column A	Column B	Column C	Column D	Column E	Column F	Column G	
	Untransformed	Transformed	Untransformed Mean	Transformed Mean			
Sample Number	Oil & Grease	Oil & Grease	Minus Untransformed	Minus Transformed	Column D	Column E	
	(mg/L)	(mg/L)	Oil & Grease Value	Oil & Grease Value	Squared	Squared	
1	20588	9.932463661	-4131.769231	-0.566977643	17071516.98	0.321463648	
2	33370	10.41541257	-16913.76923	-1.049926554	286075589.6	1.102345769	
3	5680	8.644706512	10776.23077	0.720779506	116127149.6	0.519523096	
4	16700	9.723163998	-243.7692308	-0.357677981	59423.43787	0.127933538	
5	8520	9.05017162	7936.230769	0.315314398	62983758.82	0.099423169	
6	6 14580		1876.230769	-0.221919988	3520241.899	0.049248481	
7	4006	8.295548516	12450.23077	1.069937501	155008246.2	1.144766257	
8	5240	8.564076777	11216.23077	0.80140924	125803832.7	0.642256771	
9	2460	7.807916629	13996.23077	1.557569389	195894475.7	2.426022401	
10	10240	9.234056899	6216.230769	0.131429119	38641524.98	0.017273613	
11	7240	8.887376485	9216.230769	0.478109532	84938909.59	0.228588725	
12	3700	8.216088099	12756.23077	1.149397919	162721423.4	1.321115576	
13	1958	7.579678823	14498.23077	1.785807195	210198695.4	3.189107336	
14	17440	9.766521697	-983.7692308	-0.40103568	967801.8994	0.160829616	
15	19040	9.854297308	-2583.769231	-0.488811291	6675863.438	0.238936478	
16	16200	9.692766521	256.2307692	-0.327280504	65654.2071	0.107112528	
17	9780	9.188094763	6676.230769	0.177391255	44572057.28	0.031467657	
18	8880	9.091556836	7576.230769	0.273929182	57399272.67	0.075037197	
19	28120	10.24423635	-11663.76923	-0.878750328	136043512.7	0.772202139	
20	37900	10.54270639	-21443.76923	-1.177220373	459835238.8	1.385847808	
21	7212	8.883501584	9244.230769	0.481984433	85455802.51	0.232308994	
22	28840	10.26951859	-12383.76923	-0.904032574	153357740.4	0.817274894	
. 23	5788	8.663542088	10668.23077	0.70194393	113811147.7	0.492725281	
24	57260	10.95535758	-40803,76923	-1.589871561	1664947583	2.52769158	
25	37660	10.5363538	-21203.76923	-1.170867785	449599829.6	1.370931369	
26	19460	9.876116356	-3003.769231	-0.510630338	9022629.592	0.260743342	
Column Sum	427862	243.5026365			4640798923	19.66217726	
Column Sum/N	16456.23077	9.365486018					
Column Sum/(N-1)				'	185631956.9	0.786487091	
SQRT(Column Sum/(N-	1))				13624.6819	0.886841074	
					-		
				- · · · · · · · · · · · · · · · · · · ·	Transformed conve	rtea	
			Untransformed	Transformed	to Untransformed		
		Mean	16456.23077	9.365486018	11678.28038		
		Std Dev	13624.6819	0.886841074	1		
		Permit Limit	45367.80576	11.24736278	76677.43736		
		Table 3-2 Const	i ant = 2.122				

CALCULATIONS FOR N	EW PERMIT LIMIT:	\$				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	5-Day BOD	5-Day BOD	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	5-Day BOD Value	5-Day BOD Value	Squared	Squared
1	425000	12.95984445	-340926.9231	-2.391939393	1.16231E+11	5.721374058
2	33500	10.41930072	50573.07692	0.148604338	2557636109	0.022083249
3	255000	12.44901882	-170926.9231	-1.881113769	29216013033	3.538589011
4	30700	10.33201793	53373.07692	0.235887122	2848685340	0.055642734
5	32000	10.37349118	52073.07692	0.194413874	2711605340	0.037796754
6	27100	10.20728901	56973.07692	0.360616048	3245931494	0.130043934
7	13800	9.532423871	70273.07692	1.035481184	4938305340	1.072221283
8	21000	9.952277717	63073.07692	0.615627339	3978213033	0.37899702
9	24400	10.10233841	59673.07692	0.465566644	3560876109	0.2167523
10	13200	9.487972109	70873.07692	1.079932947	5022993033	1.166255169
11	24100	10.08996712	59973.07692	0.477937936	3596769956	0.228424671
12	18000	9.798127037	66073.07692	0.769778018	4365651494	0.592558198
13	19900	9.898475011	64173.07692	0.669430045	4118183802	0.448136585
14	20100	9.908475094	63973.07692	0.659429961	4092554571	0.434847874
15	18900	9.846917201	65173.07692	0.720987854	4247529956	0.519823486
16	19300	9.867860375	64773.07692	0.70004468	4195551494	0.490062555
17	11300	9.332558005	72773.07692	1.235347051	5295920725	1.526082335
18	14400	9.574983486	69673.07692	0.99292157	4854337648	0.985893244
19	350000	12.76568843	-265926.9231	-2.197783378	70717128417	4.830251777
20	480000	13.08154138	-395926.9231	-2.513636328	1.56758E+11	6.318367587
21	22500	10.02127059	61573.07692	0.546634467	3791243802	0.298809241
22	54500	10.90595598	29573.07692	-0.338050925	874566878.7	0.114278428
23	73200	11.2009507	10873.07692	-0.633045645	118223801.8	0.400746788
24	26400	10.18111929	57673.07692	0.386785766	3326183802	0.149603229
25	57800	10.96474405	26273.07692	-0.396838999	690274571	0.157481191
26	99800	11.51092346	-15726.92308	-0.943018407	247336109.5	0.889283716
Column Sum ,	2185900	274.7655314			4.45601E+11	30.72440642
Column Sum/N	84073.07692	10.56790506				
Column Sum/(N-1)					17824040446	1.228976257
SQRT(Column Sum/(N-	1))				133506.7056	1.108592015
		-				
					Transformed conve	rted
			Untransformed	Transformed	to Untransformed	
		Mean	84073.07692	10.56790506	38867.16382	
		Std Dev	133506.7056	1.108592015	3.030089071	
		Permit Limit	367374.3063	12.92033731	408536.8152	
		T. I. I. O. O. O.			i	
		Table 3-2 Const	ant = 2.122			

CALCULATIONS FOR NI	EW PERMIT LIMITS	5				
Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Total Vol. Solids	Total Vol. Solids	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	Total Vol. Solids Value	Total Vol. Solids Value	Squared	Squared
1	9920	9.2023082	7189.884615	-0.029973306	51694440.78	0.000898399
2	897	6.799055862	16212.88462	2.373279032	262857627.6	5.632453365
3	3390	8.1285852	13719.88462	1.043749694	188235233.9	1.089413423
4	9270	9.134538659	7839.884615	0.037796236	61463790.78	0.001428555
5	13900	9.539644119	3209.884615	-0.367309225	10303359.24	0.134916067
6	8890	9.092682329	8219.884615	0.079652566	67566503.09	0.006344531
7	6270	8.743531634	10839.88462	0.428803261	117503098.5	0.183872236
8	25000	10.1266311	-7890.115385	-0.95429621	62253920.78	0.910681256
9	7170	8.877660934	9939.884615	0.294673961	98801306.17	0.086832743
10	2440	7.799753318	14669.88462	1.372581576	215205514.6	1.883980183
11	8430	9.039552051	8679.884615	0.132782843	75340396.94	0.017631283
12	7050	8.860782896	10059.88462	0.311551998	101201278.5	0.097064648
13	5090	8.53503311	12019.88462	0.637301785	144477626.2	0.406153565
14	2870	7.962067309	14239.88462	1.210267585	202774313.9	1.464747628
15	5820	8.669055541	11289.88462	0.503279354	127461494.6	0.253290108
16	5980	8.696175847	11129.88462	0.476159047	123874331.6	0.226727438
17	1430	7.265429723	15679.88462	1.906905171	245858781.6	3.636287331
18	5940	8.689464412	11169.88462	0.482870482	124766322.3	0.233163902
19	27000	10.20359214	-9890.115385	-1.031257251	97814382.32	1.063491517
?0	38400	10.55581274	-21290.11538	-1.383477844	453269013.1	1.914010946
21	16400	9.705036614	709.8846154	-0.53270172	503936.1672	0.283771122
22	55300	10.92052819	-38190.11538	-1.748193293	1458484913	3.056179791
23	59200	10.98867682	-42090.11538	-1.816341927	1771577813	3.299097994
24	10700	9.27799902	6409.884615	-0.105664126	41086620.78	0.011164908
25	35300	10.47163824	-18190.11538	-1.299303349	330880297.7	1.688189192
26	72800	11.19547123	-55690.11538	-2.02313634	3101388952	4.09308065
Column Sum	444857	238.4807072			9536645269	31.67487278
Column Sum/N	17109.88462	9.172334894				
Column Sum/(N-1)					381465810.7	1.266994911
SQRT(Column Sum/(N-	1))				19531.14975	1.125608685
					Transformed conve	rted
	İ		Untransformed	Transformed	to Untransformed	
		Mean	17109.88462	9.172334894	9627.076674	
		Std Dev	19531,14975	1.125608685	3.082092301	
		Permit Limit	58554.9844	11.56087652	104911.9308	
		Table 3-2 Consta	ant = 2.122			

CALCULATIONS FOR N	EW PERMIT LIMIT:	\$		ĺ		
Column A	Column B	Column C	Column D	Column E	Cotumn F	Column G
	Untransformed	Transformed	Untransformed Mean	Transformed Mean		
Sample Number	Total Solids	Total Solids	Minus Untransformed	Minus Transformed	Column D	Column E
	(mg/L)	(mg/L)	Total Solids Value	Total Solids Value	Squared	Squared
1	17300	9.75846178	7563.076923	0.075910442	57200132.54	0.005762395
2	6790	8.823206221	18073.07692	1.011166002	326636109.5	1.022456684
3	8480	9.045465729	16383.07692	0.788906494	268405209.5	0.622373456
4	19200	9.862665558	5663.076923	-0.028293335	32070440.24	0.000800513
5	27500	10.22194128	-2636.923077	-0.387569061	6953363.314	0.150209777
6	17600	9.775654181	7263.076923	0.058718042	52752286.39	0.003447808
7	12100	9.400960732	12763.07692	0.433411491	162896132.5	0.187845521
8	33200	10.41030515	-8336.923077	-0.575932932	69504286.39	0.331698742
9	15600	9.655026193	9263.076923	0.179346029	85804594.08	0.032164998
10	7730	8.952864142	17133.07692	0.881508081	293542324.9	0.777056497
11	16300	9.698920387	8563.076923	0.135451836	73326286.39	0.0183472
12	14500	9.581903928	10363.07692	0.252468294	107393363.3	0.06374024
13	11900	9.384293679	12963.07692	0.450078544	168041363.3	0.202570695
14	9900	9.200290036	14963.07692	0.634082187	223893671	0.402060219
15	12000	9.392661929	12863.07692	0.441710294	165458747.9	0.195107984
16	12700	9.449357272	12163.07692	0.38501495	147940440.2	0.148236512
17	5390	8.592300664	19473.07692	1.242071559	379200724.9	1.542741757
18	9350	9.143131622	15513.07692	0.6912406	240655555.6	0.477813568
19	33500	10.41930072	-8636.923077	-0.584928495	74596440.24	0.342141344
20	45900	10.7342204	-21036.92308	-0.899848173	442552132.5	0.809726735
21	22000	9.998797732	2863.076923	-0.16442551	8197209.467	0.027035748
22	64800	11.07906088	-39936.92308	-1.24468866	1594957825	1.549249859
23	72400	11.18996158	-47536.92308	-1.355589356	2259759056	1.837622501
24	18700	9.836278803	6163.076923	-0.00190658	37983517.16	3.63505E-06
25	45300	10.72106231	-20436.92308	-0.886690089	417667824.9	0.786219314
26	86300	11.36558488	-61436.92308	-1.531212654	3774495517	2.344612193
Column Sum	646440	255.6936778			11471884554	13.8810459
Column Sum/N	24863.07692	9.834372223				
Column Sum/(N-1)					458875382.2	0.555241836
SQRT(Column Sum/(N-	1))		·		21421.37676	0.745145513
					Transformed conve	erted
			Untransformed	Transformed	to Untransformed	
		Mean	24863.07692	9.834372223	18664.38092	!
		Std Dev	21421.37676	0.745145513	2.106747972	
		Permit Limit	70319.2384	11.415571	90723.43679	
		Table 3-2 Const	 ant = 2.122		-	
		12210 0 2 001130				

RSA Permit #OD 93-0	02				;				
shore Storage Tank -	All Constituents								
		Total Volatile	5-Day Biological						
	Total Solids	Solids	Oxygen Demand	Oil & Grease	Total Phosphorus	Total Nitrogen	Ammonia	pН	Density
Month/Day/Year	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(pH units)	(g/mL)
9/8/93	17300	9920	425000	20588	3500	19040	8400	6.65	0.9
10/6/93	6790	897	33500	33370	750	2940	560	7.06	1.0
10/14/93	8480	3390	255000	5680	1400	3080	840	6.61	1.0
11/3/93	19200	9270	30700	16700	2400	5880	3450	7.39	1.0
11/9/93	27500	13900	32000	8520	2100	6160	3480	6.73	1.0
11/16/93	17600	8890	27100	14580	2200	7840	6580	6.87	
12/6/93	12100	6270	13800	4006	600	4480	1880	6.43	1.0
12/13/93	33200	25000	21000	5240	1200	8120	1180	6.28	1.0
1/4/94	15600	7170	24400	2460	1000	5880	2650	6.86	1.0
1/10/94	7730	2440	13200	10240	1200	5880	1850	6.74	1.0
2/1/94	16300	8430	24100	7240	1000	5880	2390	6.93	0.9
2/7/94	14500	7050	18000	3700	1000	4760	2000	6.96	
3/1/94	11900	5090	19900	1958	600	7280	2290	6.94	
3/7/94	9900	2870	20100	17440	800	6160	2500	6.68	0.9
4/4/94	12000	5820	18900	19040	1900	5880	2050	7	0.9
4/11/94	12700	5980	19300	16200	2000	7280	2300	6.72	1.0
5/2/94	5390	1430	11300	9780	1200	1960	1960	7.36	1.0
5/10/94	9350	5940	14400	8880	1200	4760	1590	6.32	0.9
6/7/94	33500	27000	350000	28120	1000	4480	2030	6.02	0.9
6/14/94	45900	38400	480000	37900	1000	7560	2250	6.16	
7/5/94	22000	16400	22500	7212	1000	2800	1220	6.25	
7/12/94	64800	55300	54500	28840	700	4480	1440	6.2	VII. VII. VII. VII. VII. VII. VII. VII.
8/1/94	72400	59200	73200	5788	1200	3080	2800	6	0.9
8/8/94	18700	10700	26400	57260	/ 1000	7560	2240	6.02	
9/6/94	45300	35300	57800	37660	2400	3920	3370	6.5	
9/12/94	86300	72800	99800	19460		4480	3530	6.03	

To: mlee, r9ocean/pcotter

From: Pat Young <R90EA/PYOUNG>

Date: 24 Mar 93 12:56:32

Subject: Conversation with Norman Wei

Talked with Norman Wei on 3/19 (Mike he will send stormwater pollution prevention plan directly to me). He mentioned that they've been having problems with the MV ASTRO; the pump broke down one day and they had to shut down the plant. This is confiedntial at this point but the canneries will soon sign a contract with the new boat operator and will try to get the boat to Samoa within 45-60 days of contract signing. The vessell is not the Champion as stated in their permit application but is a sister ship, the Blue North. Ship dimensions, etc. will be forthcoming when deal is finalized. The ship has double redundancy and is more seaworthy than the ASTRO and the boat operators seem more reliable.

I mentioned to Norman that we discussed with the canneries in Samoa the possibility of exploring getting a plotter to go with their GPS system. This way the printouts can be used as records for them and us. He thought it was a good idea and suggested putting it in as a permit requirement. I will send him letter (and VCS) giving him contact name of Coast Guard person for more information.